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No. 23-1922

In the
United States Court of Appeals
for the Federal Circuit

BEARBOX LLC, AUSTIN STORMS,

Plaintiffs-Appellants,

v.

LANCIUM LLC, MICHAEL T. McNAMARA, RAYMOND E. CLINE, JR.,

Defendants-Appellees.

Appeal from the United States District Court
for the District of Delaware, No. 1:21-cv-00534-GBW-CJB
The Honorable Gregory B. Williams

JOINT APPENDIX

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IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

BEARBOX LLC and AUSTIN STORMS, Plaintiffs, v. LANCIUM LLC, MICHAEL T. MCNAMARA, and RAYMOND E. CLINE, JR. Defendants.	**CONFIDENTIAL -** **<u>FILED UNDER SEAL</u>** C.A. No. 21-534-GBW-CJB

LETTER TO THE HONORABLE GREGORY B. WILLIAMS FROM ANDREW C. MAYO IN OPPOSITION TO DEFENDANTS' EMERGENCY MOTION TO STRIKE (D.I. 236)

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Dated: November 18, 2022

{01858305;v1 }

Dear Judge Williams:

The Court should permit Dr. McClellan to supplement his expert opinion to address the Court's Markman Order. The Scheduling Order required the parties to inform the Court by October 15, 2021 if claim construction would be needed. D.I. 35 ¶ 8 (setting August 27, 2021 deadline); D.I. 54 (extending deadline). Both parties maintained during discovery that claim construction would not be needed. *See, e.g.*, D.I. 54 (indicating that "Defendants do not believe claim construction will be needed," and opposing Plaintiffs' request to extend the time to ask the Court for claim construction). Defendants first raised claim construction in a summary judgment motion on June 15, 2022.

Defendants now seek to parlay their belated request for claim construction into a request to hold that Dr. McClellan may not offer opinion testimony with the benefit of the Court's claim construction. Striking Dr. McLellan's supplement and barring the proposed testimony would be an extreme sanction for alleged prejudice that, if it even existed, is the result of Defendants' own litigation strategy.

Dr. McClellan's supplement does not prejudice the defendants. His supplement incorporates the language of the Court's claim construction issued on October 28, 2022, and clarifies his opinions accordingly. He does not seek to offer entirely new opinions about the inventorship of the patent-in-suit. Because Dr. McClellan had no notice that Defendants would seek an express claim construction from the Court during summary judgment briefing, he did not have an opportunity to address that construction in his original reports.

Moreover, Defendants' emergency motion makes nearly no attempt to identify specific aspects of Dr. McClellan's supplement that they believe is new or prejudicial. Instead, the motion simply seeks to preclude any of Dr. McClellan's testimony addressing the Court's claim construction and providing his inventorship opinions in terms of those constructions. In view of these circumstances, and the limited nature of Dr. McClellan's supplement, the Defendants will not be prejudiced if the Court permits Dr. McClellan to offer his opinions as explained in his supplement. Defendants' motion should be denied.

I. BACKGROUND

At the outset of this case, Defendants proposed that the parties use a non-patent scheduling order because Defendants believed claim construction was not necessary. Ex. A. The parties compromised, agreeing that "by August 27, 2021, the parties shall determine whether or not claim construction is necessary and further notify the Court of their decision." D.I. 35 ¶ 8. The Court, at Plaintiffs' request, and over Defendants' objection, extended that deadline to October 15, 2021. D.I. 54 ("Defendants do not believe claim construction will be needed, and Defendants oppose Plaintiffs' attempt to extend the deadline in Paragraph 8 of the Scheduling Order until October 15, 2021."). On October 15, 2021, Defendants again told the Court that they "do not request claim construction at this time." D.I. 63.

On June 25, 2021, Plaintiffs responded to Defendants' interrogatories asking for a detailed description of Mr. Storms' conception, reduction to practice, and development of the technology Plaintiffs contend is claimed in the '433 Patent, on a claim-by-claim, element-by-element basis.

Ex. B. Plaintiffs supplemented those responses on August 27, 2021, and again on November 9, 2021. Exs. C, D. Plaintiffs' responses included citations to source code files, images, drawings, notes, data, and correspondence, for each element of all 20 claims of the '433 patent, providing in detail Plaintiffs understanding of the scope of each claim term. In addition, on November 22, 2021, Plaintiffs responded to Defendants' interrogatory asking for Plaintiffs' understanding of the meaning of "power option agreement." Plaintiffs responded that they understood the meaning of the term to be consistent with the its use in the '433 patent, and "includes an agreement between an entity associated with the delivery of power to the load and the load," and is "consistent with how Defendants used the term 'power option agreement' in Defendants' lawsuit asserting the '433 patent against competitor Layer1." Ex. E. Plaintiffs went on to specifically identify Defendants' use of "power option agreement" in that complaint and its accompanying claim chart, in which Defendants stated that "demand response contracts are power option agreements," and described how the "power option agreement" limitation could be met: "by entering into 'demand response' contracts … these data centers can be tapped in real time to meet peak market demand by shutting down mining operations at a minute's notice … Layer1 will be able to make more money by shutting off its mining machines and allowing the power to flow through its substation to the grid." Ex. E ¶ 16.

Defendants raised no claim construction disputes in response to these contentions during discovery.

The evidence cited and described in these contentions is the exact same evidence Dr. McClellan analyzed in his opening report, served on April 5, 2022. Dr. McClellan applied the plain meaning of the claim terms, and reserved the right to supplement if any party sought claim construction after the close of expert discovery. Ex. G, ¶ 49 ("I reserve the right to supplement my report should … the Court provide[] a construction…."). Defendants' expert, Dr. Ehsani, responded to Dr. McClellan's opening report with boilerplate objections, and said "I also apply the plain and ordinary meaning of the claim terms," and "I reserve the right to supplement my report should Plaintiffs' experts use a different construction, or provide their understanding of the plain and ordinary meaning that is different than my understanding of the plain and ordinary meaning." Ex. H. Dr. McClellan served a reply report on May 20, 2022. Ex. I.

On June 15, 2022, Defendants first raised a claim construction dispute to support their motion for summary judgment. Defendants justified the late request by pointing to "ambiguous" testimony during Dr. McClellan's deposition, which Defendants contend Plaintiffs have cited selectively and misleadingly.[1] *See, e.g.*, D.I. 149 at 19. Plaintiffs took issue with those selective

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[1] Defendants motion cites the same quote from Dr. McClellan's deposition that they cited in their summary judgment brief, in which Dr. McClellan says: "[w]hether I use that power to do something with or whether I sell that power to somebody else, that's separate from the power option agreement." D.I. 237 at 3. But this quote is in response to a question that confusingly asks "Q. You agree to buy that much power or consume that much power?" and is part of a larger answer about controllable loads versus non-controllable loads. Over the next two questions, which Defendants conveniently omit, Dr. McClellan testifies clearly and consistently with his opinions, and the plain meaning of "power option agreement" and "minimum power threshold." Ex. J at 84:14-20 ("Q. What's your understanding of a minimum power threshold in this case as used in the '433 patent? A. That's the data that's associated with the option agreement. Q. What

citations, the untimeliness of Defendants' claim construction dispute, and reiterated that Dr. McClellan's opinions have at all times been consistent; his understanding of the plain meaning of the terms not differing in substance from the meanings proposed by Defendants.

At the *Markman* hearing, Plaintiffs presented compromise proposals, which were adopted-in-part in the Court's October 28, 2022 claim construction decision, and the Court resolved the "remaining dispute" for the terms-at-issue that "center[ed] on … whether the load must use at least the amount of power subject to the option." D.I. 219 at 7, 14.

Though Plaintiffs disagreed that the claim terms should include a "use" limitation, Plaintiffs believed at all times that Dr. McClellan's opinions as expressed in his reports and at his deposition considered the "use" limitation and concluded that Plaintiffs' conception and communication of the inventions claimed in the '433 patent "used" power to mine Bitcoin within the meaning of the claims. *See, e.g.*, Ex. G ¶¶ 62, 69, 178 ("a generated mining revenue figure to be expect from **using power** to mine Bitcoin") (emphasis added); Ex J at 83:5-84:22 ("Q: What specifically is a minimum power threshold? A: That's the amount of power that you're **contracted to consume**."). The Court agreed that the claim construction dispute was not dispositive of summary judgment of Plaintiffs' inventorship claims, denying Defendants' motion. D.I. 230.

II. DR. MCCLELLAN'S SUPPLEMENT

Dr. McClellan's supplement states that his "opinions have not changed," that Mr. Storms' conceived and possessed the technology claimed in the '433 patent and communicated those inventions to Defendants. Ex. K ¶¶ 1-2, 11-12. Dr. McClellan explains that the only new information he considered is the Court's claim construction decision, and "although [Dr. McClellan] did not expressly apply [the Court's] constructions," Dr. McClellan's understanding of the Court's interpretation of the terms is "consistent with and nearly identical to" his understanding of those terms as expressed in his reports. See, e.g., *Id.* at ¶ 7, 17-18. Dr. McClellan's Supplement further clarifies that his deposition testimony, though given prior to the Court's claim construction ruling, is consistent with that ruling. *Id*. at ¶ 6-10.

III. APPLICABLE LAW

Parties have an obligation to provide a written report containing a complete statement of all opinions an expert witness will express. Fed. R. Civ. P. 26(a)(2)(b)-(e). Supplements to expert reports are permitted if they do not offer new opinions, only "elaborations," "clarifications," and "further detail" on existing opinions. *Vectura Ltd. v. GlaxoSmithKline, LLC*, No. 16-638-RGA, 2019 WL 1436296, at *2 (D. Del. Apr. 1, 2019) (permitting expert's supplement that "reiterates his opinions … and elaborated on how he had reached that opinion by providing greater detail.... such an elaboration on his prior [report] is appropriate"). This is particularly true when experts first "offer their opinions before the court issue[s] its claim construction." *Golden Bridge Tech., Inc. v. Apple Inc.*, No. 10-428-SLR, 2013 WL 1431652, at *3 (D. Del. Apr. 9, 2013).

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specifically is a minimum power threshold? A. That's the amount of power that you're contracted to consume.").

Courts evaluating whether an expert's supplement is elaboration or clarification, as opposed to a new opinion, do not require "verbatim consistency," but rather "reasonable synthesis." *Dow Chem. Co. v. Nova Chemicals Corp. (Canada)*, No. CIV.A. 05-737-JJF, 2010 WL 2044931, at *2 (D. Del. May 20, 2010); quoting Power *Integrations, Inc. v. Fairchild Semiconductor Int'l, Inc.*, 585 F.Supp.2d 568, 581 (D. Del. 2008).

Even if an expert offers a new opinion in a supplemental report, striking the opinion is an "extreme sanction," not normally warranted absent a showing of willful deception or flagrant disregard of court orders. *In re Paoli R.R. Yard PCB Litig.*, 35 F.3d 717, 792 (3d Cir. 1994). Courts in the Third Circuit apply the *Pennypack* factors in making this determination: (1) the prejudice or surprise to the party against whom the evidence is offered; (2) the possibility of curing the prejudice; (3) the potential disruption of an orderly and efficient trial; (4) the presence of bad faith or willfulness in failing to disclose the evidence; and (5) the importance of the information withheld. *Meyers v. Pennypack Woods Home Ownership Ass'n*, 559 F.2d 894, 904–05 (3d Cir. 1977).

IV. ARGUMENT

Dr. McClellan's supplement is an elaboration on his earlier opinions, offered only to synthesize those opinions with the words the Court used to construe "power option agreement" and "minimum power threshold." The Court's decision resolved an alleged dispute that Defendants did not raise until after the close of expert discovery, based on contentions Defendants knew about for a year. Despite their rhetoric, Defendants make little attempt to identify specifically what they believe constitutes "new opinions and analysis" to be stricken. *Dow Chem. Co. v. Nova Chemicals Corp. (Canada)*, No. CIV.A. 05-737-JJF, 2010 WL 2044931, at *3 (D. Del. May 20, 2010) (movant failed to identify any specific objectionable content, finding supplement "only elaborate[s] and, therefore, should not be excluded").

While Dr. McClellan may not have used the exact words in his reports and deposition as articulated by the Court as the plain meaning of the terms "power option agreement" and "minimum power threshold," the substance of his opinions is consistent with the plain meaning of those terms as the Court has construed them. *Integra Lifesciences Corp. v. HyperBranch Med. Tech., Inc.*, No. 15-819-LPS-CJB, 2018 WL 1785033, at *4 (D. Del. Apr. 4, 2018) ("the focus should not be on whether the expert used identical words for the term … instead, it should be on whether the expert employed the same effective meaning"). Defendants, in possession of Plaintiffs' contentions for a year, and Dr. McClellan's reports for months, failed to raise a claim construction dispute until the last minute. If Defendants believed that Dr. McClellan's opinions were based on a substantive disagreement about the scope of a claim term, Defendants could have raised that dispute with the Court promptly. They did not.

Instead, Defendants waited until summary judgment to raise a claim construction dispute based on a few curated deposition quotes as a path to a dipositive ruling. Defendants lost that gamble, and should not be rewarded for their strategic choice by excluding Dr. McClellan's opinions at trial as he seeks only to incorporate the Court's analysis into his existing opinions. *Dow*, 2010 WL 2044931, at *3 (denying motion to strike expert supplement because it was based on an issue the movant "introduced to the litigation after the deadline to file expert reports").

Even if Defendants are correct, and the supplement contains new opinions (it does not), the *Pennypack* factors weigh against the extreme sanction of striking it. The first and second factors, prejudice to Defendants, and ability to cure that prejudice, weigh against striking the supplement. The supplement offers no new opinions that would prejudice Defendants; the supplement merely restates and elaborates on Dr. McClellan's original opinions, which Defendants have known since April 5, 2022, and which are consistent with Plaintiffs' contentions, which Defendants have known since at least November 22, 2021. Defendants cannot manufacture prejudice from its pursuit of late-stage claim construction on positions known throughout the case, a situation of their own creation. *Dow*, 2010 WL 2044931, at *3.

Any minor prejudice here can be readily remedied by the Court allowing Defendants' expert to address Dr. McClellan's opinions, also applying the language of the Court's claim construction. Plaintiffs have no objection to Dr. Ehsani addressing the Court's claim construction or responding to the explanations Dr. McClellan provides in his supplement.

The third *Pennypack* factor, disruption of an orderly and efficient trial, also weighs against striking the Supplement because no new opinions means no prejudice, no surprise, and no need for further supplements or discovery. Again, any disruption due to timing is a result of Defendants' decision to raise claim construction for the first time their summary judgment motion. According to Defendants, their expert, Dr. Ehsani, has already taken the Court's constructions into account, and therefore, there is no need to delay the trial to allow for additional expert discovery.

Defendants' strained efforts to allege bad faith fail, meaning the fourth *Pennypack* factor weighs against striking Dr. McClellan's supplement. Plaintiffs filed their First Amended Complaint as a matter of course under Rule 15(a)(1)(B), and they filed their Second Amended Complaint with the Court's permission. D.I. 92. Although the Court struck a portion of the Second Amended Complaint, this does not rise to the level of a "pattern of filings" in "egregious" violation of court orders. *Withrow v. Spears*, 967 F. Supp. 2d 982, 1006 (D. Del. 2013). Moreover, neither of these amended complaints had anything to do with claim construction or Dr. McClellan's opinions. This does not satisfy the bad faith factor.

The final *Pennypack* factor, importance of the evidence, weighs against striking. Expert opinions such as Dr. McClellan's are "critical evidence" and allowing all of his opinions will be helpful to the Court. *EON Corp.IP Holdings LLC v. FLO TV Inc.*, No. CV 10-812-RGA, 2013 WL 6504689, at *5 (D. Del. Dec. 10, 2013).

Respectfully,

/s/ Andrew C. Mayo

Andrew C. Mayo (#5207)

ACM/nlm

cc: All counsel of record (via electronic mail)

EXHIBIT A

From: Stover, Chad <Chad.Stover@btlaw.com>
Sent: Wednesday, May 26, 2021 12:11 PM
To: Benjamin T. Horton; Ray Ricordati; Mayo, Andrew C.; Chelsea M. Murray; John R. Labbe
Cc: Nelson, Mark
Subject: BearBox and Storms v. Lancium - Rule 26(f) discovery conference
Attachments: Proposed Phase I Schedule on Threshold Inventorship Issue.docx

External - This email is from an external email address outside the firm.

Ben,

We noticed that BearBox/Storms dropped their trade secret claims in the Amended Complaint. Can you confirm that those claims are dropped with prejudice? If so, we'd like to file a stipulation to that effect.

Also, in preparation for our Rule 26(f) conference today, attached is a proposal for an initial phase to decide the inventorship issue. We believe a phased approach would make sense here. We look forward to discussing with you later today.

Thanks,
Chad

Chad S.C. Stover | Partner
Barnes & Thornburg LLP
1000 N. West Street Suite 1500, Wilmington, DE 19801
Direct: (302) 300-3474 | Mobile: (302) 766-2932

BARNES & THORNBURG LLP

Atlanta | California | Chicago | Delaware | Indiana | Michigan | Minneapolis
New York | Ohio | Raleigh | Salt Lake City | Texas | Washington, D.C.

Proposed Phase I Schedule on Threshold Inventorship Issue

The parties would agree to an initial first phase of the litigation on the threshold issue of inventorship (Counts I and II of the Amended Complaint). Those two counts would be tried to either Judge Noreika or a Magistrate Judge (Lancium is open to either) about eight months from now. We propose that the parties agree to the following limits and deadlines for this first phase.

Initial disclosures – June 18, 2021

Joinder of Parties and Amendment of Pleadings – July 15, 2021

Application to Court for Protective Order – June 18, 2021

Substantial completion of document production – August 31, 2021

Fact discovery deadline – October 21, 2021

Fact discovery limits – 50 RFAs, 20 interrogatories, 50 requests for production, 3 fact depositions per side

Expert discovery deadline – December 21, 2021

Expert limitations: Limit of one technical expert per side, one opening report from Plaintiffs' expert, one rebuttal report from Defendants' expert, one deposition of each expert

No dispositive motions or Daubert motions

Pretrial conference at the end of January 2022

Two-day bench trial in February 2022

To the extent not specifically addressed above, follow Judge Noreika's Non-Patent, Bench Trial form scheduling order at
https://www.ded.uscourts.gov/sites/ded/files/chambers/April%202021%20-%20MN%20Scheduling%20Order%20-%20Non-Patent%20-%20Bench%20Trial.pdf

After the Court issues a ruling on this first phase, the parties would meet and confer about whether a second phase is needed and, if needed, what form it should take.

EXHIBIT B

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

BEARBOX LLC and AUSTIN STORMS,	)	
Plaintiffs,	)	
v.	)	C.A. No. 21-534-MN
LANCIUM LLC, MICHAEL T. MCNAMARA, and RAYMOND E. CLINE, JR.	)	
Defendants.	)	

PLAINTIFFS' OBJECTIONS AND RESPONSES TO DEFENDANTS' FIRST SET OF REQUESTS FOR PRODUCTION OF DOCUMENTS (NOS. 1-11)

Pursuant to Rules 34 and 26 of the Federal Rules of Civil Procedure, Plaintiffs, BearBox LLC and Austin Storms ("Plaintiffs" or "BearBox"), respond and object to the first set of requests for production of documents from Defendants Lancium LLC, Michael T. McNamara, and Raymond E. Cline, Jr. ("Defendants" or "Lancium"), as follows:

PRELIMINARY STATEMENT

Plaintiffs' responses to Defendants' First Set of Requests for Production of Documents are made to the best of Plaintiffs' present knowledge, information and belief. Plaintiffs expressly reserve the right to supplement and amend these responses, in accordance with applicable rules, to incorporate further information and documents and to offer such further information and documents at any trial or hearing in this case.

Plaintiffs makes the objections and responses set forth below without waiving: (1) the right to object to the use of any response, document or thing for any purpose in this action or any other actions on grounds of privilege, relevancy, materiality, or any other appropriate basis; (2) the right to object to any other discovery requests involving or relating to the subject matter of the responses herein and any documents or things produced by Plaintiffs; (3) the right to revise,

correct, supplement, or clarify any of the responses provided below at any time; and (4) the right to seek a protective order with respect to discovery directed to damages.

GENERAL OBJECTIONS

1. Plaintiffs object to each definition, instruction, or request to the extent that Defendants seeks to impose upon Plaintiffs any requirement or discovery obligation greater than or different from those under the Federal Rules of Civil Procedure, the Local Rules for the United States District Court for the District of Delaware, or any Order of the Court in this action.

2. Plaintiffs object to each request to the extent that it calls for information subject to a confidentiality obligation owed to a non party to this case, until such time as the non party agrees to the release of such information or document, or an appropriate Court order is entered.

3. Plaintiffs object to each request to the extent that it seeks premature disclosure of legal analysis and conclusions, and/or expert discovery relating to potential issues in this case, including infringement, enforceability, and validity of any claim of the patents-in-suit. Plaintiffs will provide such information, to the extent within the possession, custody, or control of Plaintiffs, as required by the Federal Rules of Civil Procedure, the Local Rules, and the schedule established by the Court.

4. Plaintiffs object to each request to the extent that the discovery sought by such request is unreasonably cumulative or duplicative or is obtainable from some other source that is more convenient, less burdensome, or less expensive.

5. Plaintiffs object to each request to the extent it seeks documents and information that are neither relevant nor appear to be reasonably calculated to lead to the discovery of admissible evidence. To the extent that Plaintiffs identifies information or produces documents in response to these requests, Plaintiffs does not concede that the information provided is relevant to this case or admissible at any hearing or trial.

6. Plaintiffs object to each request to the extent it is frivolous, interposed for an improper purpose, unreasonable, unduly burdensome, or expensive considering the needs of the case, in violation of Federal Rule of Civil Procedure 26(g)(1)(B).

7. Plaintiffs object to each request to the extent it purports to require Plaintiffs to identify information or produce documents or portions of documents that are protected by the attorney-client privilege, the work product doctrine, the common interest doctrine, or any other applicable privilege, doctrine, immunity, or rule.

8. Plaintiffs object to each request that does not contain a reasonable time limitation as overly broad, unduly burdensome, and not reasonably calculated to lead to the discovery of admissible evidence.

9. A partial response to any request is not a waiver of any objection made to that request. By asserting these various objections, Plaintiffs does not waive other objections that may become applicable.

10. Plaintiffs object to each request to the extent it seeks e-mail discovery. Such requests are premature at this time and will be conducted pursuant to the procedures set forth in the Electronic Discovery Default Standard Order.

11. Plaintiffs object to the definitions of "BearBox" and "You" to the extent that these terms are defined to include not only the named Plaintiffs, BearBox LLC and Austin Storms, but also "all predecessors and/or successors thereto; all parents, divisions or subsidiaries thereof, whether wholly or partially owned; and all partners, directors, owners, officers, members, employees, agents, representatives, and any other persons under the control of Plaintiffs, Inc., including but not limited to Plaintiffs' counsel" as compound, vague, ambiguous, overly broad,

unduly burdensome and beyond the scope of permissible discovery under the Federal Rules of Civil Procedure.

12. Plaintiffs object to the definition of "Defendants' Patents" to the extent it seeks to encompass patents, systems, functionality, and/or subject matter that is not relevant in this case.

13. Plaintiffs object to the definition of "concerning," "regarding," and "relating to" as too vague. Plaintiffs will interpret these terms to mean mention, refer to, or constitute.

14. Plaintiffs object to the definition of "Communication" to the extent it is inconsistent with the Default Standard for Discovery, adopted by this Court.

15. Plaintiffs objects to each and every request to the extent it seeks "each," "every," or "all" documents relating to the requests on the ground that such scope is overly broad, that the production of "each," "every," or "all" documents would be unduly burdensome, and that documents beyond those necessary and sufficient to describe such information are neither relevant nor reasonably calculated to lead to the discovery of admissible evidence.

16. Plaintiffs object to each request to the extent it seeks information subject to a confidentiality obligation due to a third party and/or disclosure of such information would be subject to governmental or other regulation.

17. Plaintiffs object to each request to the extent the request calls for interpretation of terms that have not yet been construed.

18. Plaintiffs object to each request to the extent that it requires disclosure of confidential, trade secret, or other proprietary information prior to entry of a suitable protective order.

19. These General Objections are hereby incorporated by reference into the responses made with respect to each separate request. Neither the inclusion nor exclusion of any Specific

Objection in response to a request shall in any way be deemed as a waiver of any General Objection made herein or that may be asserted at another date. Plaintiffs' response to any request is not, and shall not be construed as, an admission of the relevance or admissibility into evidence of such response or of the propriety of any of Plaintiff's requests.

RESPONSES AND OBJECTIONS TO REQUESTS

REQUEST FOR PRODUCTION NO. 1:

All Documents referred to, relied on, or identified in response to any interrogatory served by Defendants on Plaintiffs in this case.

RESPONSE:

BearBox objects to Request for Production No. 1 to the extent that it seeks "All Documents" as the burden of the requested discovery outweighs its likely benefit. BearBox further objects to this request to the extent that it seeks documents protected by the attorney-client privilege and/or the work product doctrine. BearBox further objects to this request to the extent that it seeks the identification of documents that are already known to Lancium, or documents that are already within Lancium's possession, custody, or control, or to which Lancium has equal or greater access, for example press releases, the '433 patent, and documents and information previously provided by Plaintiffs to Defendants.

Subject to its general and specific objections, BearBox will produce relevant, responsive and non-privileged documents to the extent any exist within its possession, custody, and control and can be located after a reasonable search. For example, BearBox will produce source code, diagrams, communications, and notes.

REQUEST FOR PRODUCTION NO. 2:

All Documents concerning Lancium LLC, including all Communications to or from Lancium and all Communications with any person or entity about Lancium.

RESPONSE:

BearBox objects to Request for Production No. 2 as overly broad, unduly burdensome, and not proportional to the needs of the case to the extent that Defendants seek the production of "All Documents" and "all Communications" with "any person or entity." BearBox further objects to this request to the extent that it seeks the identification of documents that are already known to Lancium, are within Lancium's possession, custody, or control, or to which Lancium has equal or greater access. For example, Lancium has access to "all Communications to or from Lancium." Fed. R. Civ. P. 26(b)(2)(C)(i). BearBox further objects to this request to the extent that it seeks information not relevant to the claims or defenses of any party. BearBox objects to Request No. 2 to the extent that it seeks documents protected by the attorney-client privilege, work product doctrine, and/or other applicable doctrine. BearBox further objects to this request to the extent that it seeks e-mail discovery before the parties have met, conferred, and reached agreement concerning the scope and timing of such discovery as contemplated in the Court's Electronic Discovery Default Standard.

Subject to its general and specific objections, BearBox will produce relevant, responsive and non-privileged documents and communications to the extent any exist and are within its possession, custody, and control and can be located after a reasonable search.

REQUEST FOR PRODUCTION NO. 3:

All Documents concerning Michael McNamara.

RESPONSE:

BearBox objects to Request for Production No. 3 as overly broad, unduly burdensome, and not proportional to the needs of the case to the extent that Defendants seek the production of "All Documents." BearBox further objects to this request to the extent that it seeks publicly available information and documents within the control of third parties or other parties to this

litigation, including Defendant Michael McNamara. BearBox further objects to this request to the extent that it seeks the production of documents that are not relevant to the claims or defenses of any party. BearBox further objects to this request to the extent that it seeks e-mail discovery before the parties have met, conferred, and reached agreement concerning the scope and timing of such discovery as contemplated in the Court's Electronic Discovery Default Standard.

Subject to its general and specific objections, BearBox will produce relevant, responsive and non-privileged documents to the extent any exist within its possession, custody, and control and can be located after a reasonable search.

REQUEST FOR PRODUCTION NO. 4:

All Documents concerning Raymond Cline.

RESPONSE:

BearBox objects to Request for Production No. 4 as overly broad, unduly burdensome, and not proportional to the needs of the case to the extent that Defendants seek the production of "All Documents." BearBox further objects to this request to the extent that it seeks publicly available information and documents within the control of third parties or other parties to this litigation, including Defendant Raymond Cline. BearBox further objects to this request to the extent that it seeks the production of documents that are not relevant to the claims or defenses of any party. BearBox further objects to this request to the extent that it seeks e-mail discovery before the parties have met, conferred, and reached agreement concerning the scope and timing of such discovery as contemplated in the Court's Electronic Discovery Default Standard.

Subject to its general and specific objections, BearBox will produce relevant, responsive and non-privileged documents to the extent any exist within its possession, custody, and control and can be located after a reasonable search.

REQUEST FOR PRODUCTION NO. 5:

All Documents concerning David Henson.

RESPONSE:

BearBox objects to Request for Production No. 5 as overly broad, unduly burdensome, and not proportional to the needs of the case to the extent that Defendants seek the production of "All Documents." BearBox further objects to this request to the extent that it seeks publicly available information and documents within the control of third parties or other parties to this litigation. BearBox further objects to this request to the extent that it seeks the production of documents that are not relevant to the claims or defenses of any party. BearBox further objects to this request to the extent that it seeks e-mail discovery before the parties have met, conferred, and reached agreement concerning the scope and timing of such discovery as contemplated in the Court's Electronic Discovery Default Standard.

Subject to its general and specific objections, BearBox will produce relevant, responsive and non-privileged documents to the extent any exist within its possession, custody, and control and can be located after a reasonable search.

REQUEST FOR PRODUCTION NO. 6:

Documents and Communications reflecting every person or entity that has owned, operated, or directed BearBox, including organizational charts, bylaws, articles of incorporation, limited liability company agreements, or other corporate documents governing the operation of BearBox.

RESPONSE:

BearBox objects to Request for Production No. 6 as vague and ambiguous, particularly with respect to the terms "owned, operated, or directed." BearBox further objects to this request as overly broad, unduly burdensome, and not proportional to the needs of the case to the extent that Defendants seek the production of all documents and communications. BearBox further

objects to this request to the extent that it seeks e-mail discovery before the parties have met, conferred, and reached agreement concerning the scope and timing of such discovery as contemplated in the Court's Electronic Discovery Default Standard.

Subject to its general and specific objections, BearBox will produce relevant, responsive and non-privileged documents, to the extent any exist within its possession, custody, and control and can be located after a reasonable search, reflecting the sole person that has owned and directed BearBox, Plaintiff Austin Storms.

REQUEST FOR PRODUCTION NO. 7:

Documents sufficient to identify the date and manner that Plaintiffs learned of each of Defendants' Patents.

RESPONSE:

BearBox objects to Request for Production No. 7 because the request is not proportional to the needs of the case, as the burden of the requested discovery (e.g., "each of Defendants' Patents") outweighs its likely benefit. BearBox further objects to this request as not reasonably calculated to lead to the discovery of admissible evidence to the extent that "Defendants' Patents" encompasses systems, functionality, and/or subject matter that is not part of the '433 Patent. Bearbox objects to Request No. 7 to the extent it seeks documents protected by the attorney-client privilege, work product doctrine, and/or other applicable doctrine. BearBox further objects to this request to the extent that it seeks e-mail discovery before the parties have met, conferred, and reached agreement concerning the scope and timing of such discovery as contemplated in the Court's Electronic Discovery Default Standard. BearBox further objects to Request No. 7 to the extent that it seeks the identification of documents that are already known to Lancium, or documents that are already within Lancium's possession, custody, or control, or to which Lancium has equal or greater access, for example press releases and Lancium's Answer

and Counterclaims in this action. BearBox further objects to this request as duplicative or cumulative with other discovery sought in this case, for example Request for Production No. 1 and Interrogatory No. 6. Fed. R. Civ. P. 26(b)(2)(C)(i).

Subject to its general and specific objections, BearBox will produce relevant, responsive and non-privileged documents sufficient to identify the date and manner that BearBox learned of Defendants' Patents, to the extent any exist within its possession, custody, and control and can be located after a reasonable search.

REQUEST FOR PRODUCTION NO. 8:

Documents sufficient to identify the date and manner that Plaintiffs learned of Lancium LLC's PCT Patent Application, Publication No. WO2019139632A1.

RESPONSE:

BearBox objects to Request for Production No. 8 as duplicative or cumulative with other discovery sought in this case, for example Request for Production No. 1 and Interrogatory No. 7. Fed. R. Civ. P. 26(b)(2)(C)(i). BearBox further objects to this request to the extent that it seeks documents protected by the attorney-client privilege, work product doctrine, and/or other applicable doctrine. BearBox further objects to this request to the extent that it seeks e-mail discovery before the parties have met, conferred, and reached agreement concerning the scope and timing of such discovery as contemplated in the Court's Electronic Discovery Default Standard. BearBox further objects to Request No. 8 to the extent that it seeks the identification of documents that are already known to Lancium, or documents that are already within Lancium's possession, custody, or control, or to which Lancium has equal or greater access, for example Lancium's Answer and Counterclaims in this action.

Subject to its general and specific objections, BearBox will produce relevant, responsive and non-privileged documents, to the extent any exist within its possession, custody, and control and can be located after a reasonable search.

REQUEST FOR PRODUCTION NO. 9:

Documents sufficient to identify the relationship between Austin Storms and Great American Mining, including all contracts or agreements between the two.

RESPONSE:

BearBox objects to Request for Production No. 9 as unduly burdensome and not proportional to the needs of the case to the extent that it seeks the production of documents within the control of third parties and/or third party confidential information. BearBox further objects to this request to the extent that it seeks the production of documents that are not relevant to the claims or defenses of any party. BearBox further objects to this request to the extent that it seeks e-mail discovery before the parties have met, conferred, and reached agreement concerning the scope and timing of such discovery as contemplated in the Court's Electronic Discovery Default Standard. BearBox further objects to this request as duplicative or cumulative with other discovery sought in this case, for example Request for Production No. 1 and Interrogatory No. 9. Fed. R. Civ. P. 26(b)(2)(C)(i).

Subject to its general and specific objections, BearBox will produce relevant, responsive and non-privileged documents, to the extent any exist within its possession, custody, and control and can be located after a reasonable search. For example, BearBox will produce all agreements between Austin Storms and Great American Mining regarding intellectual property rights.

REQUEST FOR PRODUCTION NO. 10:

All documents concerning the conception, reduction to practice, and development of the BearBox Technology.

RESPONSE:

BearBox objects to Request for Production No. 10 as overly broad, unduly burdensome, and not proportional to the needs of the case to the extent that Defendants seek "All documents." BearBox further objects to this request as vague and ambiguous as "BearBox Technology" is not defined in Defendants' First Set of Requests to Produce to Plaintiffs. To the extent Defendants intended to apply their definition of "BearBox Technology" provided in Defendants' First Set of Interrogatories, BearBox further objects as "the cryptocurrency mining system described in paragraph 2 of Plaintiffs' Complaint" is an incorrect description of "BearBox Technology." Plaintiffs have replaced their Complaint with the First Amended Complaint, filed May 24, 2021, making Defendants' definition improper. To the extent Defendants are referring to paragraph 2 of Plaintiffs' First Amended Complaint, that is also inappropriate, overly vague, mischaracterizes the record, and frustrates the discovery process. Plaintiffs' statements in paragraph 2 of the First Amended Complaint are qualified as "general" summary statements related to the BearBox technology meant to be informative as part of the pleading process. In addition, many other paragraphs of the First Amended Complaint further described the BearBox Technology, including paragraph 4, which states that "[t]he claimed subject matter of the '433 Patent falls fully within the scope of the BearBox Technology." For purposes of responding to this request, Plaintiffs will treat the term BearBox Technology as technology that is claimed in the '433 Patent.

BearBox further objects to Request No. 10 to the extent that it seeks e-mail discovery before the parties have met, conferred, and reached agreement concerning the scope and timing

of such discovery as contemplated in the Court's Electronic Discovery Default Standard. Bearbox further objects to this request to the extent that it seeks documents protected by the attorney-client privilege, work product doctrine, and/or other applicable doctrine. BearBox further objects to this request as duplicative or cumulative with other discovery sought in this case, for example Request for Production No. 1 and Interrogatory No. 2. Fed. R. Civ. P. 26(b)(2)(C)(i).

Subject to its general and specific objections, BearBox will produce relevant, responsive and non-privileged documents within its possession, custody, and control that can be located after a reasonable search, including source code, diagrams, communications, and notes.

REQUEST FOR PRODUCTION NO. 11:

All documents relating to the BearBox Technology.

RESPONSE:

BearBox objects to Request for Production No. 11 as overly broad, unduly burdensome, and not proportional to the needs of the case to the extent that Defendants seek "All documents." BearBox further objects to this request as vague and ambiguous as "BearBox Technology" is not defined in Defendants' First Set of Requests to Produce to Plaintiffs. To the extent Defendants intended to apply their definition of "BearBox Technology" provided in Defendants' First Set of Interrogatories, BearBox further objects as "the cryptocurrency mining system described in paragraph 2 of Plaintiffs' Complaint" is an incorrect description of "BearBox Technology." Plaintiffs have replaced their Complaint with the First Amended Complaint, filed May 24, 2021, making Defendants' definition improper. To the extent Defendants are referring to paragraph 2 of Plaintiffs' First Amended Complaint, that is also inappropriate, overly vague, mischaracterizes the record, and frustrates the discovery process. Plaintiffs' statements in paragraph 2 of the First Amended Complaint are qualified as "general" summary statements related to the BearBox

technology meant to be informative as part of the pleading process. In addition, many other paragraphs of the First Amended Complaint further described the BearBox Technology, including paragraph 4, which states that "[t]he claimed subject matter of the '433 Patent falls fully within the scope of the BearBox Technology." For purposes of responding to this request, Plaintiffs will treat the term BearBox Technology as technology that is claimed in the '433 Patent.

BearBox further objects to Request No. 11 to the extent that it seeks documents protected by the attorney-client privilege, work product doctrine, and/or other applicable doctrine. BearBox further objects to this request to the extent that it seeks publically available documents that are equally accessible to the Defendants. BearBox further objects to this request to the extent that it seeks e-mail discovery before the parties have met, conferred, and reached agreement concerning the scope and timing of such discovery as contemplated in the Court's Electronic Discovery Default Standard. BearBox further objects to this request as duplicative or cumulative with other discovery sought in this case, for example Request for Production Nos. 1, 6, and 10 and Interrogatory Nos. 2 and 5. Fed. R. Civ. P. 26(b)(2)(C)(i).

Subject to its general and specific objections, BearBox will produce relevant, responsive and non-privileged documents to the extent such documents are within its possession, custody, and control and can be located after a reasonable search. For example, BearBox will produce source code, diagrams, communications, and notes.

ASHBY & GEDDES

/s/ Andrew C. Mayo

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Dated: June 25, 2021

EXHIBIT C

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

BEARBOX LLC and AUSTIN STORMS, Plaintiffs, v. LANCIUM LLC, MICHAEL T. MCNAMARA, and RAYMOND E. CLINE, JR. Defendants.	C.A. No. 21-534-MN

PLAINTIFFS' SUPPLEMENTAL OBJECTIONS AND RESPONSES TO <u>DEFENDANTS' FIRST SET OF INTERROGATORIES (NOS. 1-9)</u>

Pursuant to Rules 33 and 26 of the Federal Rules of Civil Procedure, Plaintiffs, Bearbox LLC and Austin Storms (collectively, "Plaintiffs"), hereby supplement its Responses and Objections to the first set of interrogatories (Nos. 1-9) from Defendants, as follows:

<u>PRELIMINARY STATEMENT</u>

Plaintiffs' supplemental answers to Defendants' First Set of Interrogatories are made to the best of Plaintiffs' present knowledge, information and belief. Plaintiffs expressly reserve its right to supplement and amend these answers, in accordance with applicable rules, to incorporate further information and documents and to offer such further information and documents at any trial or hearing in this case.

Plaintiffs makes the supplemental objections and answers set forth below without waiving: (1) the right to object to the use of any answer, document or thing for any purpose in this action or any other actions on grounds of privilege, relevancy, materiality, or any other appropriate basis; (2) the right to object to any other discovery request involving or relating to the subject matter of the responses herein and any documents or things produced by Plaintiffs;

(3) the right to revise, correct, supplement, or clarify any of the responses provided below at any time; and (4) the right to seek a protective order with respect to discovery directed to damages.

GENERAL OBJECTIONS

1. Plaintiffs objects to each interrogatory, and to each definition and instruction, to the extent that it calls for the disclosure of information that is protected by the attorney-client privilege, the work-product doctrine, Fed. R. Civ. P. 26(b)(3), or any other applicable law, rule, privilege, or immunity.

2. Plaintiffs object to each interrogatory, and to each definition and instruction, to the extent that it calls for the disclosure of information referring or relating to methods and/or products, especially future methods and products, that are not the subject matter of any claim or defense in this case on the ground that such information is not relevant, would not reasonably lead to the discovery of admissible evidence, and would unduly risk competitive injury to Defendant.

3. Plaintiffs object to each interrogatory, and to each definition and instruction, to the extent that it imposes obligations beyond or inconsistent with the requirements of the Federal Rules of Civil Procedure, the Local Rules of this Court, orders entered by the Court in this case, or any other applicable orders entered by the Court.

4. Plaintiffs object to each interrogatory, and to each definition and instruction, to the extent that it seeks to combine in a single interrogatory what otherwise should be asked in separate interrogatories. Plaintiffs object to the extent that these compound interrogatories exceed or will contribute to the exceeding of the numeric limits established in this Court's Scheduling Order. Plaintiffs deem the service of these interrogatories to constitute an admission by Defendant that they will not object to the number and/or numbering of interrogatories of a similar compound nature, if served by Plaintiffs.

5. These responses are made solely for the purpose of this action. Each response is subject to all objections as to competence, relevance, materiality, propriety, inadmissibility, and any and all other objections and grounds that would require the exclusion of any statement herein if the questions were asked, or any statements contained herein were made by a witness present and testifying in court, all of which objections and grounds are reserved and may be interposed at the time of trial.

6. The fact that Plaintiffs have answered any interrogatory herein should not be taken as an admission that Plaintiffs accept or admit the existence of any facts set forth or assumed by such interrogatory, or that such response constitutes admissible evidence. The fact that Plaintiffs have answered part of, or all of, any question is not intended and shall not be construed to be a waiver by Defendant of all or any part of any objection to any interrogatory herein.

7. Plaintiffs object to the definition of "Bearbox," "Austin Storms," "Plaintiffs," "You" or "Your" to the extent the definition of any of these terms would require Plaintiffs to search for and produce any document or information that is not within their possession, custody, or control.

8. Plaintiffs object to the definition of "BearBox Technology" as "the cryptocurrency mining system described in paragraph 2 of Plaintiffs' Complaint." Plaintiffs have replaced their Complaint with the First Amended Complaint, filed May 24, 2021, making Defendants' definition improper. To the extent Defendants are referring to paragraph 2 of Plaintiffs' First Amended Complaint, that is also inappropriate, overly vague, mischaracterizes the record, and frustrates the discovery process. Plaintiffs' statements in paragraph 2 of the First Amended Complaint are qualified as "general" summary statements related to the BearBox

technology meant to be informative as part of the pleading process. In addition, many other paragraphs of the First Amended Complaint further describe the BearBox Technology, including paragraph 4, which states that "[t]he claimed subject matter of the '433 Patent falls fully within the scope of the BearBox Technology." For purposes of responding to these interrogatories, Plaintiffs will treat the term BearBox Technology to at least refer to any technology that is claimed in the '433 Patent.

9. Plaintiffs object to each interrogatory to the extent it seeks information subject to a confidentiality obligation due to a third party and/or disclosure of such information would be subject to governmental or other regulation.

10. Plaintiffs object to each interrogatory to the extent the interrogatory calls for interpretation of terms that have not yet been construed.

11. Plaintiffs object to each interrogatory to the extent that it requires disclosure of confidential, trade secret, or other proprietary information prior to entry of a suitable protective order.

12. These General Objections are incorporated into each specific response below as if they were fully repeated therein. Neither the inclusion of any Specific Objection in response to an interrogatory nor the failure to include any General Objection or Specific Objection in response to an interrogatory shall in any way be deemed as a waiver of any General Objection made herein or that may be asserted at another date. Defendant's response to any interrogatory is not, and shall not be construed as, an admission of the relevance or admissibility into evidence of such response or of the propriety of any of Plaintiff's interrogatories.

SUPPLEMENTAL OBJECTIONS AND RESPONSES TO INTERROGATORIES

Interrogatory No. 1:

Describe with particularity all aspects of the BearBox Technology, including in your

response each aspect of the BearBox Technology allegedly conveyed to any Defendant and the date of transmittal, manner of transmittal (email, text, other writing, verbal conversation, etc.), and alleged recipient at Lancium of each aspect of any BearBox Technology.

ANSWER:

Plaintiffs incorporate their General Objection related to Defendants' definition of BearBox Technology, which is incorrect. Plaintiffs object to Interrogatory No. 1 as vague and ambiguous, at least with respect to the phrases "with particularity," "all aspects," and "each aspect." Plaintiffs further object to Interrogatory No. 1 as overbroad, to the extent it asks for information regarding technology developed by the Plaintiffs that is not subject matter claimed in the '433 Patent.

Subject to these objections and their General Objections, Plaintiffs identify as technology developed by the Plaintiffs the descriptions in paragraphs 31-35 of the First Amended Complaint, including all documents and communications referenced in those paragraphs, which Defendants have in their possession, and Plaintiffs will further produce in this case. Plaintiffs further respond that the BearBox Technology encompasses at least the purported inventions claimed in the '433 Patent. Plaintiffs further respond that Austin Storms verbally communicated to Michael McNamara details regarding power option agreements, real-time pricing for cryptocurrencies and electricity, and how to use these and other variables to arrive at the technology claimed in the '433 Patent. Plaintiffs further respond that they will produce non-privileged documents responding to Interrogatory No. 1, and according to Fed. R. Civ. P. 33(d) that are within their possession, custody, or control to the extent that such documents exist in the ordinary course of business.

SUPPLEMENTAL ANSWER:

Subject to the foregoing, Plaintiffs further responds that Austin Storms verbally communicated to Michael McNamara details regarding power purchase agreements, power

option agreements, real-time pricing for cryptocurrency mining and power, and how to use these and other variables to arrive at the technology claimed in the ’433 Patent. Those details verbally communicated by Mr. Storms included describing different types of power purchase agreements and power option agreements, such as fixed and dynamic, and describing system operators like the Electric Reliability Council of Texas (“ERCOT”), the Midcontinent Independent System Operation (“MISO”), and the Southwest Power Pool (“SPP”) with respect to participating in the wholesale electricity markets and other programs, as well as the contents and conditions of power purchase agreements and power option agreements, such as variables like time intervals, minimum power thresholds, power pricing, and interrelationships between such variables, such as the dynamic participation in energy markets, including, inter alia, day-ahead and real-time markets. Mr. Storms also explained, as an exemplary benefit, how his technologies enabled the miners to capitalize on less expensive, abundant electricity from non-dispatchable generation sources while allowing load-shedding and diverting power for economic dispatch during periods of energy scarcity. Mr. Storms also described identifying variables like expected or target power consumption within different time intervals, including proprietary hardware and software integrations that allow for fine-grain load control, and power system conditions and market conditions, and developing performance strategies based on power purchase agreements, power option agreements, and their contents, the use of power acquired through power purchase agreements and power option agreements to implement such strategies to meet expected or target consumption that may include conditional operation of computing systems, or determining particular configurations or modes of computing systems with, for example, an increase or decrease of operational hardware parameters to adjust the efficiency of a cryptocurrency mining computer or multiple computers. Mr. Storms also verbally described how a QSE would

communicate with ISOs like ERCOT to evaluate and offer to sell/bid power and evaluating the terms of those agreements against expected computational requirements. This case is in the early stages of discovery and, as such, Plaintiffs reserve their rights to further supplement this Answer as the case proceeds.

Interrogatory No. 2:

Describe with particularity the conception, reduction to practice, and development of the BearBox Technology, including in your response the timing of these events and an identification of any documents or other corroborating evidence.

ANSWER:

Plaintiffs incorporate their General Objection related to Defendants' definition of BearBox Technology, which is incorrect. Plaintiffs object to Interrogatory No. 1 as vague and ambiguous, at least with respect to the phrases "with particularity," and "any documents." Plaintiffs further object to Interrogatory No. 2 as overbroad, to the extent it asks for information regarding technology developed by the Plaintiffs that is not subject matter claimed in the '433 Patent.

Subject to these objections and their General Objections, Plaintiffs will produce non-privileged documents, including correspondence, data, diagrams, algorithms, notes, and source code, including timing reflected on such documents, and corresponding metadata with such documents that includes timing, sufficient to respond to Interrogatory No. 2, and according to Fed. R. Civ. P. 33(d) that are within their possession, custody, or control to the extent that such documents exist in the ordinary course of business.

SUPPLEMENTAL ANSWER:

Subject to the foregoing, Plaintiffs further respond that Mr. Austin Storms conceived of and developed his technology in approximately late 2018 to early 2019, as noted in paragraph 27 of the First Amended Complaint. Mr. Austin Storms reduced to practice that technology over

approximately that same time period, up through April 2019. Specifically, in November 2018, Mr. Storms shared his idea of cryptocurrency mining as load-as-a-service (LaaS), under conditions of confidentiality, with Ben Hakes to potentially increase economic returns for an underutilized wind farm in the Southwest Power Pool via a behind-the-meter power purchase agreement. From December through April 2019, Mr. Storms worked on a design of a containerized mining solution at a research and development facility in Louisiana and developed a proprietary remotely switched power distribution unit that was programmed to control AC electrical circuits. In that embodiment, cryptocurrency miners are powered on/off by triggering low-voltage electromechanical relays that correspond to the IP address of specific cryptocurrency mining computers within a database table configuration.

In parallel, Mr. Storms developed a Python-based model for determining performance strategies based on monitored energy pricing and power availability data as well as cryptocurrency pricing and other related data. In one specific embodiment, each pricing node within the SPP and its location marginal pricing ("LMP") for both the day-ahead and real-time markets was compared to the dynamically calculated economics of mining cryptocurrencies at that node under various conditions. In various implementations, the system may provide an option to economically dispatch (i.e. sell) power back into the grid under scarcity or undersupply conditions (or any other conditions). In one example, the system was configured to utilize a mining operation as an interruptible or controllable load resource by participating in the wholesale markets and various programs directly. In this embodiment, and depending on the specifically desired performance strategy, the system may bid load and receive a schedule to draw load up to a dynamically calculated $/MWh breakeven price of mining cryptocurrencies and/or shed load when the wholesale markets reach or exceed that price level during that time

interval.

Additionally, the hardware and software integration developed by Mr. Storms could be used for fine-grain load control or true LaaS (referred to as CLR or LaaR within ERCOT) to provide operating reserves in the ancillary services market and address a variety of issues arising from the relationship between power supply and demand. In one example, the system's mining operation may act as a virtual power plant, ramping up or down to assist grid operators and generators in maintaining a target grid frequency more quickly than dispatchable generation sources while also solving some of the problems caused by non-dispatchable, intermittent generation sources and their curtailment due to line congestion in oversupply conditions.

Interrogatory No. 3:

For each claim of the '433 patent, state with particularity how each element of the claimed subject matter "falls fully within the scope of the BearBox Technology," as alleged in paragraph 4 of your Amended Complaint.

ANSWER:

Plaintiffs incorporate their General Objection related to Defendants' definition of BearBox Technology, which is incorrect. Plaintiffs object to Interrogatory No. 3 as vague and ambiguous, at least with respect to the phrase "with particularity." Plaintiffs further object to Interrogatory No. 3 as overbroad, to the extent it asks for information regarding technology developed by the Plaintiffs that is not subject matter claimed in the '433 Patent

Subject to these objections and their General Objections, Plaintiffs respond as set forth in the chart below. Plaintiffs also will produce non-privileged documents, including correspondence, data, diagrams, algorithms, notes, and source code, sufficient to respond to Interrogatory No. 3, and according to Fed. R. Civ. P. 33(d), that are within their possession, custody, or control to the extent that such documents exist in the ordinary course of business. Mr. Storm's testimony also will corroborate this information.

U.S. Patent No. 10,608,433	Plaintiffs' Technology
1. A system comprising: a set of computing systems, wherein the set of computing systems is configured to perform computational operations using power from a power grid;	Austin Storms conceived of and developed technology that includes a system comprising a set of computing systems, wherein the set of computing systems is configured to perform computational operations using power from a power grid.
a control system configured to: monitor a set of conditions;	Austin Storms conceived of and developed technology that includes a control system configured to monitor a set of conditions including at least real-time balancing market rate (RTBM) and day-ahead locational marginal pricing (DA LMP).
receive power option data based, at least in part, on a power option agreement, wherein the power option data specify: (i) a set of minimum power thresholds, and (ii) a set of time intervals, wherein each minimum power threshold in the set of minimum power thresholds is associated with a time interval in the set of time intervals;	Austin Storms conceived of and developed technology that includes receiving power option data based, at least in part, on a power option agreement, wherein the power option data specifies: (i) a set of minimum power thresholds, and (ii) a set of time intervals, wherein each minimum power threshold in the set of minimum power thresholds is associated with a time interval in the set of time intervals.
responsive to receiving the power option data, determine a performance strategy for the set of computing systems based on a combination of at least a portion of the power option data and at least one condition in the set of conditions, wherein the performance strategy comprises a power consumption target for the set of computing systems for each time interval in the set of time intervals, wherein each power consumption target is equal to or greater than the minimum power threshold associated with each time interval; and	Austin Storms conceived of and developed technology that determines, responsive to receiving the power option data, a performance strategy for the set of computing systems based on a combination of at least a portion of the power option data and at least one condition in the set of conditions, wherein the performance strategy comprises a power consumption target for the set of computing systems for each time interval in the set of time intervals, wherein each power consumption target is equal to or greater than the minimum power threshold associated with each time interval.

provide instructions to the set of computing systems to perform one or more computational operations based on the performance strategy.	Austin Storms conceived of and developed technology that includes providing instructions to the set of computing systems to perform one or more computational operations based on the performance strategy, such as instructing miners to mine bitcoin.
2. The system of claim 1, wherein the control system is configured to monitor the set of conditions comprising:	
a price of power from the power grid; and	Austin Storms conceived of and developed technology that includes a control system configured to monitor a price of power from the power grid, such as least day-ahead and real-time power pricing.
a plurality of parameters associated with one or more computational operations to be performed at the set of computing systems.	Austin Storms conceived of and developed technology that includes a control system configured to monitor a plurality of parameters associated with one or more computational operations to be performed at the set of computing systems, such as at least real-time Bitcoin-US Dollar exchange rate, Bitcoin network difficulty, and estimated Bitcoin network hashrate.
3. The system of claim 2, wherein the control system is configured to:	
determine the performance strategy for the set of computing systems based on a combination of at least the portion option data, the price of power from the power grid, and the plurality of parameters associated with the one or more computational operations.	Austin Storms conceived of and developed technology that determine the performance strategy for the set of computing systems based on a combination of at least the portion option data, the price of power from the power grid, and the plurality of parameters associated with the one or more computational operations, as shown in the descriptions above for claims 1 and 2.
4. The system of claim 3, wherein the performance strategy further comprises:	
an order for the set of computing systems to follow when performing the one or	Austin Storms conceived of and developed technology that includes a

more computational operations, wherein the order is based on respective priorities associated with the one or more computational operations.	performance strategy that includes an order for the set of computing systems to follow when performing the one or more computational operations, wherein the order is based on respective priorities associated with the one or more computational operations.
5. The system of claim 4, wherein the performance strategy further comprises:	
at least one power consumption target that is greater than a minimum power threshold when the price of power from the power grid is below a threshold price during the time interval associated with the minimum power threshold.	Austin Storms conceived of and/or developed technology that includes a performance that includes at least one power consumption target that is greater than a minimum power threshold when the price of power from the power grid is below a threshold price during the time interval associated with the minimum power threshold.
6. The system of claim 1, wherein the control system is further configured to:	
receive subsequent power option data based, at least in part, on the power option agreement, wherein the subsequent power option data specify to decrease one or more minimum power thresholds of the set of minimum power thresholds.	Austin Storms conceived of and developed technology that includes a control system configured to receive subsequent power option data based, at least in part, on the power option agreement, wherein the subsequent power option data specify to decrease one or more minimum power thresholds of the set of minimum power thresholds.
7. The system of claim 6, wherein the control system is further configured to:	
responsive to receiving the subsequent power option data, modify the performance strategy for the set of computing systems based on a combination of at least the portion of the subsequent power option data and at least one condition in the set of conditions, wherein the modified performance strategy comprises one or more reduced	Austin Storms conceived of and developed technology that includes a control system that is configured to responsive to receiving the subsequent power option data, modify the performance strategy for the set of computing systems based on a combination of at least the portion of the subsequent power option data and at least one condition in the set of conditions,

power consumption targets for the set of computing systems.	wherein the modified performance strategy comprises one or more reduced power consumption targets for the set of computing systems.
8. The system of claim 7, wherein the control system is further configured to:	
provide instructions to the set of computing systems to perform the one or more computational operations based on the modified performance strategy.	Austin Storms conceived of and developed technology that includes a control system configured to provide instructions to the set of computing systems to perform the one or more computational operations based on the modified performance strategy.
9. The system of claim 1, wherein the control system is a remote master control system positioned remotely from the set of computing systems.	Austin Storms conceived of and/or developed technology that includes a control system that is a remote master control system positioned remotely from the set of computing systems.
10. The system of claim 1, wherein the control system is a mobile computing device.	Austin Storms conceived of and/or developed technology that includes a control system that is a mobile computing device.
11. The system of claim 1, wherein the control system is configured to receive the power option data while monitoring the set of conditions.	Austin Storms conceived of and/or developed technology that includes a control system that is configured to receive the power option data while monitoring the set of conditions.
12. The system of claim 1, wherein the control system is further configured to:	
provide a request to a qualified scheduling entity (QSE) to determine the power option agreement; and	Austin Storms conceived of and/or developed technology that includes a control system that is configured to provide a request to a qualified scheduling entity (QSE) to determine the power option agreement.
receive power option data in response to providing the request to the QSE.	Austin Storms conceived of and/or developed technology that includes a control system that is configured to receive power option data in response to providing the request to the QSE
13. The system of claim 1, wherein the power option data specify: (i) a first	Austin Storms conceived of and/or developed technology that includes power

minimum power threshold associated with a first time interval in the set of time intervals, and (ii) a second minimum power threshold associated with a second time interval in the set of time intervals, wherein the second time interval is subsequent to the first time interval	option data that specifies: (i) a first minimum power threshold associated with a first time interval in the set of time intervals, and (ii) a second minimum power threshold associated with a second time interval in the set of time intervals, wherein the second time interval is subsequent to the first time interval
14. The system of claim 13, wherein the control system is configured to:	
determine the performance strategy for the set of computing systems such that the performance strategy comprises: a first power consumption target for the set of computing systems for the first time interval, wherein the first power consumption target is equal to or greater than the first minimum power threshold; and a second power consumption target for the set of computing systems for the second time interval, wherein the second power consumption target is equal to or greater than the second minimum power threshold.	Austin Storms conceived of and/or developed technology that includes a control system that is configured to determine the performance strategy for the set of computing systems such that the performance strategy comprises: a first power consumption target for the set of computing systems for the first time interval, wherein the first power consumption target is equal to or greater than the first minimum power threshold and a second power consumption target for the set of computing systems for the second time interval, wherein the second power consumption target is equal to or greater than the second minimum power threshold.
15. The system of claim 1, wherein a total duration of the set of time intervals corresponds to a twenty-four hour period.	Austin Storms conceived of and/or developed technology that includes calculations performed such that a total duration of the set of time intervals corresponds to a twenty-four hour period.
16. The system of claim 1, wherein the set of conditions monitored by the control system further comprise:	
a price of power from the power grid; and a global mining hash rate and a price for a cryptocurrency; and	Austin Storms conceived of and developed technology that includes a control system that monitors a price of power from the power grid, a global mining hash rate and a price for a cryptocurrency.

wherein the control system is configured to: determine the performance strategy for the set of computing systems based on a combination of at the portion of the power option data, the price of power from the power grid, the global mining hash rate and the price for the cryptocurrency, wherein the performance strategy specifies for at least a subset of the set of computing systems to perform mining operations for the cryptocurrency when the price of power from the power grid is equal to or less than a revenue obtained by performing the mining operations for the cryptocurrency.	Austin Storms conceived of and/or developed technology that includes a control system configured to determine the performance strategy for the set of computing systems based on a combination of at the portion of the power option data, the price of power from the power grid, the global mining hash rate and the price for the cryptocurrency, wherein the performance strategy specifies for at least a subset of the set of computing systems to perform mining operations for the cryptocurrency when the price of power from the power grid is equal to or less than a revenue obtained by performing the mining operations for the cryptocurrency.
17. A method comprising:	
monitoring, by a computing system, a set of conditions;	Austin Storms conceived of and developed technology that includes a method in which a computing system monitors a set of conditions.
receiving, at the computing system, power option data based, at least in part, on a power option agreement, wherein the power option data specify: (i) a set of minimum power thresholds, and (ii) a set of time intervals, wherein each minimum power threshold in the set of minimum power thresholds is associated with a time interval in the set of time intervals;	Austin Storms conceived of and developed technology that includes a method in which the computing system receives power option data based, at least in part, on a power option agreement, wherein the power option data specify: (i) a set of minimum power thresholds, and (ii) a set of time intervals, wherein each minimum power threshold in the set of minimum power thresholds is associated with a time interval in the set of time intervals.
responsive to receiving the power option data, determining a performance strategy for a set of computing systems based on a combination of at least a portion of the power option data and at least one condition in the set of conditions, wherein the performance strategy comprises a power consumption target for the set of computing systems for each time interval	Austin Storms conceived of and developed technology that determines, responsive to receiving the power option data, a performance strategy for the set of computing systems based on a combination of at least a portion of the power option data and at least one condition in the set of conditions, wherein the performance strategy comprises a

in the set of time intervals, wherein each power consumption target is equal to or greater than the minimum power threshold associated with each time interval; and	power consumption target for the set of computing systems for each time interval in the set of time intervals, wherein each power consumption target is equal to or greater than the minimum power threshold associated with each time interval.
providing instructions to the set of computing systems to perform one or more computational operations based on the performance strategy.	Austin Storms conceived of and/or developed technology that includes providing instructions to the set of computing systems to perform one or more computational operations based on the performance strategy, such as instructing miners to mine bitcoin.
18. The method of claim 17, wherein determining the performance strategy for the set of computing systems comprises:	
identifying information about the set of computing systems; and	Austin Storms conceived of and/or developed technology that includes a method including identifying information about the set of computing systems.
determining the performance strategy to further comprise instructions for at least a subset of the set of computing systems to operate at an increased frequency based on a combination of at least the portion of the power option data and the information about the set of computing systems.	Austin Storms conceived of and/or developed technology that includes a method including determining the performance strategy to further comprise instructions for at least a subset of the set of computing systems to operate at an increased frequency based on a combination of at least the portion of the power option data and the information about the set of computing systems.
19. The method of claim 17, further comprising:	
receiving subsequent power option data based, at least in part, on the power option agreement, wherein the subsequent power option data specify to decrease one or more minimum power thresholds of the set of minimum power thresholds;	Austin Storms conceived of and/or developed technology that includes a method including receiving subsequent power option data based, at least in part, on the power option agreement, wherein the subsequent power option data specify to decrease one or more minimum power thresholds of the set of minimum power thresholds.

responsive to receiving the subsequent power option data, modifying the performance strategy for the set of computing systems based on a combination of at least the portion of the subsequent power option data and at least one condition in the set of conditions, wherein the modified performance strategy comprises one or more reduced power consumption targets for the set of computing systems; and providing instructions to the set of computing systems to perform the one or more computational operations based on the modified performance strategy.	Austin Storms conceived of and/or developed technology that includes a method including, responsive to receiving the subsequent power option data, modifying the performance strategy for the set of computing systems based on a combination of at least the portion of the subsequent power option data and at least one condition in the set of conditions, wherein the modified performance strategy comprises one or more reduced power consumption targets for the set of computing systems; and providing instructions to the set of computing systems to perform the one or more computational operations based on the modified performance strategy.
20. A non-transitory computer readable medium having stored therein instructions executable by one or more processors to cause a computing system to perform functions comprising:	
monitoring a set of conditions;	Austin Storms conceived of and developed technology includes a computer system that monitors a set of conditions.
receiving power option data based, at least in part, on a power option agreement, wherein the power option data specify: (i) a set of minimum power thresholds, and (ii) a set of time intervals, wherein each minimum power threshold in the set of minimum power thresholds is associated with a time interval in the set of time intervals;	Austin Storms conceived of and/or developed technology that includes receiving power option data based, at least in part, on a power option agreement, wherein the power option data specify: (i) a set of minimum power thresholds, and (ii) a set of time intervals, wherein each minimum power threshold in the set of minimum power thresholds is associated with a time interval in the set of time intervals.

responsive to receiving the power option data, determining a performance strategy for a set of computing systems based on a combination of at least a portion of the power option data and at least one condition in the set of conditions, wherein the performance strategy comprises a power consumption target for the set of computing systems for each time interval in the set of time intervals, wherein each power consumption target is equal to or greater than the minimum power threshold associated with each time interval; and	Austin Storms conceived of and/or developed technology that includes, responsive to receiving the power option data, determining a performance strategy for a set of computing systems based on a combination of at least a portion of the power option data and at least one condition in the set of conditions, wherein the performance strategy comprises a power consumption target for the set of computing systems for each time interval in the set of time intervals, wherein each power consumption target is equal to or greater than the minimum power threshold associated with each time interval.
providing instructions to the set of computing systems to perform one or more computational operations based on the performance strategy.	Austin Storms conceived of and/or developed technology that includes providing instructions to the set of computing systems to perform one or more computational operations based on the performance strategy.

Interrogatory No. 4:

For each claim of the ‘632 Application, state with particularity each aspect of the BearBox Technology that does not fall within the scope of the ‘632 Application disclosure and describe with particularity why it does not, including but not limited to, those aspects denied in your Answer to Defendant’s Counterclaims at, e.g., paragraphs 61-72 and 76-82.

ANSWER:

Plaintiffs incorporate their General Objection related to Defendants’ definition of BearBox Technology, which is incorrect. Plaintiffs object to Interrogatory No. 4 as vague and ambiguous, at least with respect to the phrases “for each claim,” “with particularity,” and “any documents.” Plaintiffs further object to Interrogatory No. 4 as overbroad, to the extent it asks for information regarding technology developed by the Plaintiffs that is not subject matter claimed in the ’433 Patent. Plaintiffs further object that paragraphs 61-72 and 76-82 do not allege any particular scope of any claim of the ’632 Application and, on that basis, Plaintiffs do not

understand Interrogatory No. 4 and therefore cannot respond to it.

Subject to these objections and their General Objections, Plaintiffs respond that its Answer to Defendants' Counterclaims deny specifically the subject matter that is not disclosed in the '632 Application. For example, in paragraph 62, Plaintiffs state that "the '632 Application [does not use] the term 'energy efficient' or 'cryptocurrency mining systems.'" Generally, the '632 Application fails to disclose that which was cited by the United States Patent & Trademark Office in the January 27, 2020 Notice of Allowance of claims 1-20 of the '433 Patent, in particular the "examiner's statement of reasons for allowance" of those claims, including at least a failure to disclose a system for receiving power option data based, at least in part, on a power option agreement, wherein the power option data specify: (i) a set of minimum power thresholds and (ii) a set of time intervals, wherein each minimum power threshold in the set of minimum power thresholds is associated with a time interval in the set of time intervals; a failure to disclose a system, responsive to receiving the power option data, for determining a performance strategy for the set of computing systems based on a combination of at least a portion of the power option data and at least one condition in the set of conditions, wherein the performance strategy comprises a power consumption target for the set of computing systems for each time interval in the set of time intervals, wherein each power consumption target is equal to or greater than the minimum power threshold associated with each time interval; and a failure to disclose providing instructions to the set of computing systems to perform one or more computation operations based on the performance strategy.

<u>Interrogatory No. 5:</u>

Describe with particularity all aspects of the BearBox Technology that have been deployed in use by Plaintiffs or by others with Plaintiffs' permission, including in your response the dates of use of each aspect and the party using the particular aspect.

ANSWER:

Plaintiffs incorporate their General Objection related to Defendants' definition of BearBox Technology, which is incorrect. Plaintiffs object to Interrogatory No. 4 as vague and ambiguous, at least with respect to the phrases "all aspects," and "with particularity." Plaintiffs further object to Interrogatory No. 4 as overbroad, to the extent it asks for information regarding technology developed by the Plaintiffs that is not subject matter claimed in the '433 Patent.

Subject to these objections and their General Objections, Plaintiffs respond that Mr. Storms built a system that practiced the inventions as claimed in one or more claims of the '433 patent, based on his conception of the inventions as claimed in the '433 patent, and that system was operational on or about April 21, 2019, and was used only by BearBox and Mr. Storms. Plaintiffs further respond that Plaintiffs built no other systems practicing the inventions claimed in the '433 patent, nor did Plaintiffs, at any time, give permission to any other party to build or use any system practicing the inventions as claimed in the '433 patent.

SUPPLEMENTAL ANSWER:

Subject to the foregoing, Plaintiffs further respond that the system deployed by Mr. Austin Storms on or about April 21, 2019 practiced the inventions as described in claims 1-20 of the '433 patent, and further include features not claimed in the '433 patent, but described in the '433 patent, such as (1) the use of a behind-the-meter (BTM) power generation source(s), (2) the use of various power purchasing mechanism(s), including various types of power purchasing mechanism(s) offered by ERCOT, MISO, SPP, and/or other ISOs, (3) the use of periodic or updated data relating to power prices, power usage, cryptocurrency information (including current exchange pricing, hash rate, network difficulty, and the like), (4) modifying power usage based on monitored data and power prices, (5) monitoring conditions such as (i) a price of power

from a power grid, (ii) a plurality of parameters associated with a set of computational operations to be performed at the set of computing systems, and (iii) a plurality of parameters associated with the set of computing systems, (6) applying various weights to data in determining a mining strategy, which were later claimed in U.S. Patent Nos. 11,016,458 and/or 11,031,783. Plaintiffs further respond that the system deployed by Mr. Austin Storms includes features not known by Plaintiffs to be claimed in a Lancium patent, or patent application, including the use of various power purchasing arrangement(s) not described or claimed in the ’433, ’458 or ’783 Patents, including various types of power purchasing arrangements offered by ERCOT and/or other power supply entities.

Interrogatory No. 6:

Identify when and in what manner Plaintiffs learned of each of Defendants’ Patents.

ANSWER:

Plaintiffs object to Interrogatory No. 6 to the extent it calls for information protected by the attorney-client privilege or work-product doctrine. Plaintiffs object to Interrogatory No. 6 as overbroad, at least with respect to the phrases “in what manner.” Plaintiffs further object to Interrogatory No. 6 as overbroad, and seeking irrelevant information regarding “each of Defendants’ Patents.”

Subject to these objections and their General Objections, Plaintiffs respond that Mr. Austin Storms first learned of the ’433 Patent on August 17, 2020 by reading a press release dated August 14, 2020 issued by Lancium regarding its lawsuit against Layer1 pending in the District Court for the Western District of Texas. Plaintiffs had not learned of any other of Defendants’ patents prior to this lawsuit.

<u>Interrogatory No. 7:</u>

Identify when and in what manner Plaintiffs learned of Lancium LLC's PCT Patent Application, Publication No. WO2019139632A1.

<u>ANSWER:</u>

Plaintiffs object to Interrogatory No. 7 to the extent it calls for information protected by the attorney-client privilege or work-product doctrine. Plaintiffs object to Interrogatory No. 7 as overbroad, at least with respect to the phrases "in what manner." Subject to these objections and their General Objections, Plaintiffs respond that they learned of the '632 Application through Defendants' first Answer and Counterclaims, filed May 3, 2021.

<u>Interrogatory No. 8:</u>

Describe with particularity why Plaintiffs did not file suit against Defendants when Plaintiffs first learned of the '433 patent, including in your response the identity of any person or entity providing information related to that decision and the information provided.

<u>ANSWER:</u>

Plaintiffs object to Interrogatory No. 8 as vague and ambiguous, at least with respect to the phrases "with particularity," "any person or entity," and "that decision." Plaintiffs further object to Interrogatory No. 8 to the extent is seeks information protected by the attorney-client privilege and/or work product doctrine.

Subject to these objections and their General Objections, Plaintiffs respond that they did file suit after learning of the '433 Patent, after a reasonable amount of time to analyze the patent, disclose information to Layer1 counsel regarding Plaintiffs inventorship rights, and upon learning by press release dated March 8, 2021 that the lawsuit filed by Lancium against Layer1 was settled, without correcting inventorship or otherwise resolving the rights of Mr. Austin Storms related to the '433 patent. Mr. Austin Storms took a reasonable amount of time after the March 8, 2021 press release to explore Plaintiffs' rights, retain counsel, and prepare and file this

lawsuit on April 14, 2021, about five weeks later.

Interrogatory No. 9:

Describe with particularity the relationship between Plaintiffs and Great American Mining.

ANSWER:

Plaintiffs object to Interrogatory No. 9 as vague and ambiguous, at least with respect to the phrases "with particularity," and "the relationship." Plaintiffs further object to Interrogatory No. 8 to the extent is seeks information protected by the attorney-client privilege and/or work product doctrine.

Subject to these objections and their General Objections, Plaintiffs respond that Austin Storms was not employed by or otherwise involved with Great American Mining prior to or during his conception or reduction to practice of the BearBox Technology including the subject matter claimed in the '433 patent, and Great American Mining has no ownership rights to the technology developed by Plaintiffs at issue in this lawsuit.

Dated: August 27, 2021

By: _/s/ Andrew C. Mayo_
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EXHIBIT D

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

BEARBOX LLC and AUSTIN STORMS, Plaintiffs, v. LANCIUM LLC, MICHAEL T. MCNAMARA, and RAYMOND E. CLINE, JR. Defendants.	C.A. No. 21-534-MN-CJB **HIGHLY CONFIDENTIAL - ATTORNEYS' EYES ONLY**

PLAINTIFFS' SUPPLEMENTAL OBJECTIONS AND RESPONSES TO <u>DEFENDANTS' FIRST SET OF INTERROGATORIES (NOS. 1-9)</u>

Pursuant to Rules 33 and 26 of the Federal Rules of Civil Procedure, Plaintiffs, Bearbox LLC and Austin Storms (collectively, "Plaintiffs"), hereby supplement its Responses and Objections to the first set of interrogatories (Nos. 1-9) from Defendants, as follows:

<u>PRELIMINARY STATEMENT</u>

Plaintiffs' supplemental answers to Defendants' First Set of Interrogatories are made to the best of Plaintiffs' present knowledge, information and belief. Plaintiffs expressly reserve its right to supplement and amend these answers, in accordance with applicable rules, to incorporate further information and documents and to offer such further information and documents at any trial or hearing in this case.

Plaintiffs makes the supplemental objections and answers set forth below without waiving: (1) the right to object to the use of any answer, document or thing for any purpose in this action or any other actions on grounds of privilege, relevancy, materiality, or any other appropriate basis; (2) the right to object to any other discovery request involving or relating to the subject matter of the responses herein and any documents or things produced by Plaintiffs; (3) the right to revise, correct, supplement, or clarify any of the responses provided below at any

time; and (4) the right to seek a protective order with respect to discovery directed to damages.

GENERAL OBJECTIONS

1. Plaintiffs objects to each interrogatory, and to each definition and instruction, to the extent that it calls for the disclosure of information that is protected by the attorney-client privilege, the work-product doctrine, Fed. R. Civ. P. 26(b)(3), or any other applicable law, rule, privilege, or immunity.

2. Plaintiffs object to each interrogatory, and to each definition and instruction, to the extent that it calls for the disclosure of information referring or relating to methods and/or products, especially future methods and products, that are not the subject matter of any claim or defense in this case on the ground that such information is not relevant, would not reasonably lead to the discovery of admissible evidence, and would unduly risk competitive injury to Defendant.

3. Plaintiffs object to each interrogatory, and to each definition and instruction, to the extent that it imposes obligations beyond or inconsistent with the requirements of the Federal Rules of Civil Procedure, the Local Rules of this Court, orders entered by the Court in this case, or any other applicable orders entered by the Court.

4. Plaintiffs object to each interrogatory, and to each definition and instruction, to the extent that it seeks to combine in a single interrogatory what otherwise should be asked in separate interrogatories. Plaintiffs object to the extent that these compound interrogatories exceed or will contribute to the exceeding of the numeric limits established in this Court's Scheduling Order. Plaintiffs deem the service of these interrogatories to constitute an admission by Defendant that they will not object to the number and/or numbering of interrogatories of a similar compound nature, if served by Plaintiffs.

5. These responses are made solely for the purpose of this action. Each response is subject to all objections as to competence, relevance, materiality, propriety, inadmissibility, and any and all other objections and grounds that would require the exclusion of any statement herein if the questions were asked, or any statements contained herein were made by a witness present and testifying in court, all of which objections and grounds are reserved and may be interposed at the time of trial.

6. The fact that Plaintiffs have answered any interrogatory herein should not be taken as an admission that Plaintiffs accept or admit the existence of any facts set forth or assumed by such interrogatory, or that such response constitutes admissible evidence. The fact that Plaintiffs have answered part of, or all of, any question is not intended and shall not be construed to be a waiver by Defendant of all or any part of any objection to any interrogatory herein.

7. Plaintiffs object to the definition of "Bearbox," "Austin Storms," "Plaintiffs," "You" or "Your" to the extent the definition of any of these terms would require Plaintiffs to search for and produce any document or information that is not within their possession, custody, or control.

8. Plaintiffs object to the definition of "BearBox Technology" as "the cryptocurrency mining system described in paragraph 2 of Plaintiffs' Complaint." Plaintiffs have replaced their Complaint with the First Amended Complaint, filed May 24, 2021, making Defendants' definition improper. To the extent Defendants are referring to paragraph 2 of Plaintiffs' First Amended Complaint, that is also inappropriate, overly vague, mischaracterizes the record, and frustrates the discovery process. Plaintiffs' statements in paragraph 2 of the First Amended Complaint are qualified as "general" summary statements related to the BearBox

Technology meant to be informative as part of the pleading process. In addition, many other paragraphs of the First Amended Complaint further describe the BearBox Technology, including paragraph 4, which states that "[t]he claimed subject matter of the '433 Patent falls fully within the scope of the BearBox Technology." For purposes of responding to these interrogatories, Plaintiffs will treat the term BearBox Technology to at least refer to any technology that is claimed in the '433 Patent.

9. Plaintiffs object to each interrogatory to the extent it seeks information subject to a confidentiality obligation due to a third party and/or disclosure of such information would be subject to governmental or other regulation.

10. Plaintiffs object to each interrogatory to the extent the interrogatory calls for interpretation of terms that have not yet been construed.

11. Plaintiffs object to each interrogatory to the extent that it requires disclosure of confidential, trade secret, or other proprietary information prior to entry of a suitable protective order.

12. These General Objections are incorporated into each specific response below as if they were fully repeated therein. Neither the inclusion of any Specific Objection in response to an interrogatory nor the failure to include any General Objection or Specific Objection in response to an interrogatory shall in any way be deemed as a waiver of any General Objection made herein or that may be asserted at another date. Defendant's response to any interrogatory is not, and shall not be construed as, an admission of the relevance or admissibility into evidence of such response or of the propriety of any of Plaintiff's interrogatories.

SUPPLEMENTAL OBJECTIONS AND RESPONSES TO INTERROGATORIES

Interrogatory No. 1:

Describe with particularity all aspects of the BearBox Technology, including in your response each aspect of the BearBox Technology allegedly conveyed to any Defendant and the date of transmittal, manner of transmittal (email, text, other writing, verbal conversation, etc.), and alleged recipient at Lancium of each aspect of any BearBox Technology.

ANSWER:

Plaintiffs incorporate their General Objection related to Defendants' definition of BearBox Technology, which is incorrect. Plaintiffs object to Interrogatory No. 1 as vague and ambiguous, at least with respect to the phrases "with particularity," "all aspects," and "each aspect." Plaintiffs further object to Interrogatory No. 1 as overbroad, to the extent it asks for information regarding technology developed by the Plaintiffs that is not subject matter claimed in the '433 Patent.

Subject to these objections and their General Objections, Plaintiffs identify as technology developed by the Plaintiffs the descriptions in paragraphs 31-35 of the First Amended Complaint, including all documents and communications referenced in those paragraphs, which Defendants have in their possession, and Plaintiffs will further produce in this case. Plaintiffs further respond that the BearBox Technology encompasses at least the purported inventions claimed in the '433 Patent. Plaintiffs further respond that Austin Storms verbally communicated to Michael McNamara details regarding power option agreements, real-time pricing for cryptocurrencies and electricity, and how to use these and other variables to arrive at the technology claimed in the '433 Patent. Plaintiffs further respond that they will produce non-privileged documents responding to Interrogatory No. 1, and according to Fed. R. Civ. P. 33(d) that are within their possession, custody, or control to the extent that such documents exist in the ordinary course of business.

SUPPLEMENTAL ANSWER:

Subject to the foregoing, Plaintiffs further responds that Austin Storms verbally communicated to Michael McNamara details regarding power purchase agreements, power option agreements, real-time pricing for cryptocurrency mining and power, and how to use these and other variables to arrive at the technology claimed in the ’433 Patent. Those details verbally communicated by Mr. Storms included describing different types of power purchase agreements and power option agreements, such as fixed and dynamic, and describing system operators like the Electric Reliability Council of Texas (“ERCOT”), the Midcontinent Independent System Operation (“MISO”), and the Southwest Power Pool (“SPP”) with respect to participating in the wholesale electricity markets and other programs, as well as the contents and conditions of power purchase agreements and power option agreements, such as variables like time intervals, minimum power thresholds, power pricing, and interrelationships between such variables, such as the dynamic participation in energy markets, including, inter alia, day-ahead and real-time markets. Mr. Storms also explained, as an exemplary benefit, how his technologies enabled the miners to capitalize on less expensive, abundant electricity from non-dispatchable generation sources while allowing load-shedding and diverting power for economic dispatch during periods of energy scarcity. Mr. Storms also described identifying variables like expected or target power consumption within different time intervals, including proprietary hardware and software integrations that allow for fine-grain load control, and power system conditions and market conditions, and developing performance strategies based on power purchase agreements, power option agreements, and their contents, the use of power acquired through power purchase agreements and power option agreements to implement such strategies to meet expected or target consumption that may include conditional operation of computing systems, or determining

particular configurations or modes of computing systems with, for example, an increase or decrease of operational hardware parameters to adjust the efficiency of a cryptocurrency mining computer or multiple computers. Mr. Storms also verbally described how a QSE would communicate with ISOs like ERCOT to evaluate and offer to sell/bid power and evaluating the terms of those agreements against expected computational requirements. This case is in the early stages of discovery and, as such, Plaintiffs reserve their rights to further supplement this Answer as the case proceeds.

<u>SECOND SUPPLEMENTAL ANSWER:</u>

Subject to the foregoing, Plaintiff further responds that Storms orally communicated the details outlined above to McNamara on or about May 3, 2019, and further communicated this information to McNamara via text and email messages continuing through May 9, 2019. Plaintiff also states that documents produced that are responsive to this request include BB00000090 – BB00000097. These documents identified by Plaintiff include .CSV files, annotated system diagrams showing performance strategy logic based on monitored conditions and energy pricing parameters, information describing the system's hardware components and an email regarding the same. Additionally, the source code files listed in the Appendix hereto (BB_SC00000001-67) are responsive to this request and are available to Defendants for inspection.

<u>Interrogatory No. 2:</u>

Describe with particularity the conception, reduction to practice, and development of the BearBox Technology, including in your response the timing of these events and an identification of any documents or other corroborating evidence.

<u>ANSWER:</u>

Plaintiffs incorporate their General Objection related to Defendants' definition of BearBox Technology, which is incorrect. Plaintiffs object to Interrogatory No. 1 as vague and

ambiguous, at least with respect to the phrases "with particularity," and "any documents." Plaintiffs further object to Interrogatory No. 2 as overbroad, to the extent it asks for information regarding technology developed by the Plaintiffs that is not subject matter claimed in the '433 Patent.

Subject to these objections and their General Objections, Plaintiffs will produce non-privileged documents, including correspondence, data, diagrams, algorithms, notes, and source code, including timing reflected on such documents, and corresponding metadata with such documents that includes timing, sufficient to respond to Interrogatory No. 2, and according to Fed. R. Civ. P. 33(d) that are within their possession, custody, or control to the extent that such documents exist in the ordinary course of business.

SUPPLEMENTAL ANSWER:

Subject to the foregoing, Plaintiffs further respond that Mr. Austin Storms conceived of and developed his technology in approximately late 2018 to early 2019, as noted in paragraph 27 of the First Amended Complaint. Mr. Austin Storms reduced to practice that technology over approximately that same time period, up through April 2019. Specifically, in November 2018, Mr. Storms shared his idea of cryptocurrency mining as load-as-a-service (LaaS), under conditions of confidentiality, with Ben Hakes to potentially increase economic returns for an underutilized wind farm in the Southwest Power Pool via a behind-the-meter power purchase agreement. From December through April 2019, Mr. Storms worked on a design of a containerized mining solution at a research and development facility in Louisiana and developed a proprietary remotely switched power distribution unit that was programmed to control AC electrical circuits. In that embodiment, cryptocurrency miners are powered on/off by triggering low-voltage electromechanical relays that correspond to the IP address of specific

cryptocurrency mining computers within a database table configuration.

In parallel, Mr. Storms developed a Python-based model for determining performance strategies based on monitored energy pricing and power availability data as well as cryptocurrency pricing and other related data. In one specific embodiment, each pricing node within the SPP and its location marginal pricing ("LMP") for both the day-ahead and real-time markets was compared to the dynamically calculated economics of mining cryptocurrencies at that node under various conditions. In various implementations, the system may provide an option to economically dispatch (i.e. sell) power back into the grid under scarcity or undersupply conditions (or any other conditions). In one example, the system was configured to utilize a mining operation as an interruptible or controllable load resource by participating in the wholesale markets and various programs directly. In this embodiment, and depending on the specifically desired performance strategy, the system may bid load and receive a schedule to draw load up to a dynamically calculated $/MWh breakeven price of mining cryptocurrencies and/or shed load when the wholesale markets reach or exceed that price level during that time interval.

Additionally, the hardware and software integration developed by Mr. Storms could be used for fine-grain load control or true LaaS (referred to as CLR or LaaR within ERCOT) to provide operating reserves in the ancillary services market and address a variety of issues arising from the relationship between power supply and demand. In one example, the system's mining operation may act as a virtual power plant, ramping up or down to assist grid operators and generators in maintaining a target grid frequency more quickly than dispatchable generation sources while also solving some of the problems caused by non-dispatchable, intermittent generation sources and their curtailment due to line congestion in oversupply conditions.

SECOND SUPPLEMENTAL ANSWER:

Subject to the foregoing, Plaintiffs further respond that Mr. Austin Storms conceived of and developed his technology in approximately late 2018 to early 2019, as noted in paragraph 27 of the First Amended Complaint. *See, e.g.,* BB00000001-20. Mr. Austin Storms reduced to practice that technology over approximately that same time period, up through April 2019. *See, e.g.,* BB000000021-72. Specifically, in November 2018, Mr. Storms shared his idea of cryptocurrency mining as load-as-a-service (LaaS), under conditions of confidentiality, with Ben Hakes to potentially increase economic returns for an underutilized wind farm in the Southwest Power Pool via a behind-the-meter power purchase agreement. From December 2018 through April 2019, Mr. Storms worked on a design of a containerized mining solution in Louisiana and developed a proprietary remotely switched power distribution unit that was programmed to control AC electrical circuits. *See, e.g.,* BB00000001-72. In that embodiment, cryptocurrency miners are powered on/off by triggering low-voltage electromechanical relays that correspond to the IP address of specific cryptocurrency mining computers within a database table configuration. *Id*.

In parallel, Mr. Storms developed a Python-based model for determining performance strategies based on monitored energy pricing and power availability data as well as cryptocurrency pricing and other related data. In one specific embodiment, each pricing node within the SPP and its location marginal pricing ("LMP") for both the day-ahead and real-time markets was compared to the dynamically calculated economics of mining cryptocurrencies at that node under various conditions. In various implementations, the system may provide an option to economically dispatch (e.g. sell) power back into the grid under scarcity or undersupply conditions (or any other conditions). In one example, the system was configured to utilize a

mining operation as an interruptible or controllable load resource ("CLR") by participating in the wholesale markets and various programs directly. In this embodiment, and depending on the specifically desired performance strategy, the system may bid load and receive a schedule to draw load up to a dynamically calculated $/MWh breakeven price of mining cryptocurrencies and/or shed load when the wholesale markets reach or exceed that price level during that time interval. *See, e.g.,* BB0000001-18, 21-28, 35-38, 45, 62 and 73-81 (showing control system through screenshots of various interfaces, photos of hardware, and whiteboard notes and logic); see also BB00000019-20, 29-34, 40-44, 46-61 and 63-72 (showing monitored conditions through mining profitability and related spreadsheets/.csv files, system diagrams and source code). Additionally, the hardware and software integration developed by Mr. Storms could be used for fine-grain load control or true LaaS (referred to as CLR or LaaR within ERCOT) to provide operating reserves in the ancillary services market and address a variety of issues arising from the relationship between power supply and demand. In one example, the system's mining operation may act as a virtual power plant, ramping load up or down to assist grid operators and generators in maintaining a target grid frequency more quickly than dispatchable generation sources while also solving some of the problems caused by non-dispatchable, intermittent generation sources and their curtailment due to line congestion in oversupply conditions. One or more of these concepts developed by Mr. Storms and conveyed to Lancium are described and/or claimed in subsequent Lancium continuation applications, that have issued or are pending, claiming priority to the applications that matured into the '433 Patent, such as U.S. Patent Nos. 11,016,458 and 11,031,783.

Subject to the foregoing, Plaintiff further responds that documents produced that are responsive to this request include, but are not limited to, BB00000001 – BB00000038 and

BB00000040 – BB00000097. These documents identified by Plaintiff include interface screenshots, photographs of whiteboard notes, logic, and calculations, photographs of system hardware, mining profitability spreadsheets, .CSV files, system diagrams, and emails regarding the same. Additionally, the source code files listed in the Appendix hereto (BB_SC00000001-67) are responsive to this request and are available to Defendants for inspection.

Interrogatory No. 3:

For each claim of the '433 patent, state with particularity how each element of the claimed subject matter "falls fully within the scope of the BearBox Technology," as alleged in paragraph 4 of your Amended Complaint.

ANSWER:

Plaintiffs incorporate their General Objection related to Defendants' definition of BearBox Technology, which is incorrect. Plaintiffs object to Interrogatory No. 3 as vague and ambiguous, at least with respect to the phrase "with particularity." Plaintiffs further object to Interrogatory No. 3 as overbroad, to the extent it asks for information regarding technology developed by the Plaintiffs that is not subject matter claimed in the '433 Patent

Subject to these objections and their General Objections, Plaintiffs respond as set forth in the chart below. Plaintiffs also will produce non-privileged documents, including correspondence, data, diagrams, algorithms, notes, and source code, sufficient to respond to Interrogatory No. 3, and according to Fed. R. Civ. P. 33(d), that are within their possession, custody, or control to the extent that such documents exist in the ordinary course of business. Mr. Storm's testimony also will corroborate this information.

U.S. Patent No. 10,608,433	Plaintiffs' Technology
1. A system comprising: a set of computing systems, wherein the set of computing systems is configured to perform computational operations using power from a power grid;	Austin Storms conceived of and developed technology that includes a system comprising a set of computing systems, wherein the set of computing systems is configured to perform

	computational operations using power from a power grid.
a control system configured to: monitor a set of conditions;	Austin Storms conceived of and developed technology that includes a control system configured to monitor a set of conditions including at least real-time balancing market rate (RTBM) and day-ahead locational marginal pricing (DA LMP).
receive power option data based, at least in part, on a power option agreement, wherein the power option data specify: (i) a set of minimum power thresholds, and (ii) a set of time intervals, wherein each minimum power threshold in the set of minimum power thresholds is associated with a time interval in the set of time intervals;	Austin Storms conceived of and developed technology that includes receiving power option data based, at least in part, on a power option agreement, wherein the power option data specifies: (i) a set of minimum power thresholds, and (ii) a set of time intervals, wherein each minimum power threshold in the set of minimum power thresholds is associated with a time interval in the set of time intervals.
responsive to receiving the power option data, determine a performance strategy for the set of computing systems based on a combination of at least a portion of the power option data and at least one condition in the set of conditions, wherein the performance strategy comprises a power consumption target for the set of computing systems for each time interval in the set of time intervals, wherein each power consumption target is equal to or greater than the minimum power threshold associated with each time interval; and	Austin Storms conceived of and developed technology that determines, responsive to receiving the power option data, a performance strategy for the set of computing systems based on a combination of at least a portion of the power option data and at least one condition in the set of conditions, wherein the performance strategy comprises a power consumption target for the set of computing systems for each time interval in the set of time intervals, wherein each power consumption target is equal to or greater than the minimum power threshold associated with each time interval.
provide instructions to the set of computing systems to perform one or more computational operations based on the performance strategy.	Austin Storms conceived of and developed technology that includes providing instructions to the set of computing systems to perform one or more computational operations based on

	the performance strategy, such as instructing miners to mine bitcoin.
2. The system of claim 1, wherein the control system is configured to monitor the set of conditions comprising:	
a price of power from the power grid; and	Austin Storms conceived of and developed technology that includes a control system configured to monitor a price of power from the power grid, such as least day-ahead and real-time power pricing.
a plurality of parameters associated with one or more computational operations to be performed at the set of computing systems.	Austin Storms conceived of and developed technology that includes a control system configured to monitor a plurality of parameters associated with one or more computational operations to be performed at the set of computing systems, such as at least real-time Bitcoin-US Dollar exchange rate, Bitcoin network difficulty, and estimated Bitcoin network hashrate.
3. The system of claim 2, wherein the control system is configured to:	
determine the performance strategy for the set of computing systems based on a combination of at least the portion option data, the price of power from the power grid, and the plurality of parameters associated with the one or more computational operations.	Austin Storms conceived of and developed technology that determine the performance strategy for the set of computing systems based on a combination of at least the portion option data, the price of power from the power grid, and the plurality of parameters associated with the one or more computational operations, as shown in the descriptions above for claims 1 and 2.
4. The system of claim 3, wherein the performance strategy further comprises:	
an order for the set of computing systems to follow when performing the one or more computational operations, wherein the order is based on respective priorities associated with the one or more computational operations.	Austin Storms conceived of and developed technology that includes a performance strategy that includes an order for the set of computing systems to follow when performing the one or more computational operations, wherein the order is based on respective priorities

	associated with the one or more computational operations.
5. The system of claim 4, wherein the performance strategy further comprises:	
at least one power consumption target that is greater than a minimum power threshold when the price of power from the power grid is below a threshold price during the time interval associated with the minimum power threshold.	Austin Storms conceived of and/or developed technology that includes a performance that includes at least one power consumption target that is greater than a minimum power threshold when the price of power from the power grid is below a threshold price during the time interval associated with the minimum power threshold.
6. The system of claim 1, wherein the control system is further configured to:	
receive subsequent power option data based, at least in part, on the power option agreement, wherein the subsequent power option data specify to decrease one or more minimum power thresholds of the set of minimum power thresholds.	Austin Storms conceived of and developed technology that includes a control system configured to receive subsequent power option data based, at least in part, on the power option agreement, wherein the subsequent power option data specify to decrease one or more minimum power thresholds of the set of minimum power thresholds.
7. The system of claim 6, wherein the control system is further configured to:	
responsive to receiving the subsequent power option data, modify the performance strategy for the set of computing systems based on a combination of at least the portion of the subsequent power option data and at least one condition in the set of conditions, wherein the modified performance strategy comprises one or more reduced power consumption targets for the set of computing systems.	Austin Storms conceived of and developed technology that includes a control system that is configured to responsive to receiving the subsequent power option data, modify the performance strategy for the set of computing systems based on a combination of at least the portion of the subsequent power option data and at least one condition in the set of conditions, wherein the modified performance strategy comprises one or more reduced power consumption targets for the set of computing systems.

8. The system of claim 7, wherein the control system is further configured to:	
provide instructions to the set of computing systems to perform the one or more computational operations based on the modified performance strategy.	Austin Storms conceived of and developed technology that includes a control system configured to provide instructions to the set of computing systems to perform the one or more computational operations based on the modified performance strategy.
9. The system of claim 1, wherein the control system is a remote master control system positioned remotely from the set of computing systems.	Austin Storms conceived of and/or developed technology that includes a control system that is a remote master control system positioned remotely from the set of computing systems.
10. The system of claim 1, wherein the control system is a mobile computing device.	Austin Storms conceived of and/or developed technology that includes a control system that is a mobile computing device.
11. The system of claim 1, wherein the control system is configured to receive the power option data while monitoring the set of conditions.	Austin Storms conceived of and/or developed technology that includes a control system that is configured to receive the power option data while monitoring the set of conditions.
12. The system of claim 1, wherein the control system is further configured to:	
provide a request to a qualified scheduling entity (QSE) to determine the power option agreement; and	Austin Storms conceived of and/or developed technology that includes a control system that is configured to provide a request to a qualified scheduling entity (QSE) to determine the power option agreement.
receive power option data in response to providing the request to the QSE.	Austin Storms conceived of and/or developed technology that includes a control system that is configured to receive power option data in response to providing the request to the QSE
13. The system of claim 1, wherein the power option data specify: (i) a first minimum power threshold associated with a first time interval in the set of time intervals, and (ii) a second minimum power threshold associated with a second	Austin Storms conceived of and/or developed technology that includes power option data that specifies: (i) a first minimum power threshold associated with a first time interval in the set of time intervals, and (ii) a second minimum

time interval in the set of time intervals, wherein the second time interval is subsequent to the first time interval	power threshold associated with a second time interval in the set of time intervals, wherein the second time interval is subsequent to the first time interval
14. The system of claim 13, wherein the control system is configured to:	
determine the performance strategy for the set of computing systems such that the performance strategy comprises: a first power consumption target for the set of computing systems for the first time interval, wherein the first power consumption target is equal to or greater than the first minimum power threshold; and a second power consumption target for the set of computing systems for the second time interval, wherein the second power consumption target is equal to or greater than the second minimum power threshold.	Austin Storms conceived of and/or developed technology that includes a control system that is configured to determine the performance strategy for the set of computing systems such that the performance strategy comprises: a first power consumption target for the set of computing systems for the first time interval, wherein the first power consumption target is equal to or greater than the first minimum power threshold and a second power consumption target for the set of computing systems for the second time interval, wherein the second power consumption target is equal to or greater than the second minimum power threshold.
15. The system of claim 1, wherein a total duration of the set of time intervals corresponds to a twenty-four hour period.	Austin Storms conceived of and/or developed technology that includes calculations performed such that a total duration of the set of time intervals corresponds to a twenty-four hour period.
16. The system of claim 1, wherein the set of conditions monitored by the control system further comprise:	
a price of power from the power grid; and a global mining hash rate and a price for a cryptocurrency; and	Austin Storms conceived of and developed technology that includes a control system that monitors a price of power from the power grid, a global mining hash rate and a price for a cryptocurrency.

wherein the control system is configured to: determine the performance strategy for the set of computing systems based on a combination of at the portion of the power option data, the price of power from the power grid, the global mining hash rate and the price for the cryptocurrency, wherein the performance strategy specifies for at least a subset of the set of computing systems to perform mining operations for the cryptocurrency when the price of power from the power grid is equal to or less than a revenue obtained by performing the mining operations for the cryptocurrency.	Austin Storms conceived of and/or developed technology that includes a control system configured to determine the performance strategy for the set of computing systems based on a combination of at the portion of the power option data, the price of power from the power grid, the global mining hash rate and the price for the cryptocurrency, wherein the performance strategy specifies for at least a subset of the set of computing systems to perform mining operations for the cryptocurrency when the price of power from the power grid is equal to or less than a revenue obtained by performing the mining operations for the cryptocurrency.
17. A method comprising:	
monitoring, by a computing system, a set of conditions;	Austin Storms conceived of and developed technology that includes a method in which a computing system monitors a set of conditions.
receiving, at the computing system, power option data based, at least in part, on a power option agreement, wherein the power option data specify: (i) a set of minimum power thresholds, and (ii) a set of time intervals, wherein each minimum power threshold in the set of minimum power thresholds is associated with a time interval in the set of time intervals;	Austin Storms conceived of and developed technology that includes a method in which the computing system receives power option data based, at least in part, on a power option agreement, wherein the power option data specify: (i) a set of minimum power thresholds, and (ii) a set of time intervals, wherein each minimum power threshold in the set of minimum power thresholds is associated with a time interval in the set of time intervals.
responsive to receiving the power option data, determining a performance strategy for a set of computing systems based on a combination of at least a portion of the power option data and at least one condition in the set of conditions, wherein the performance strategy comprises a power consumption target for the set of computing systems for each time interval	Austin Storms conceived of and developed technology that determines, responsive to receiving the power option data, a performance strategy for the set of computing systems based on a combination of at least a portion of the power option data and at least one condition in the set of conditions, wherein the performance strategy comprises a

in the set of time intervals, wherein each power consumption target is equal to or greater than the minimum power threshold associated with each time interval; and	power consumption target for the set of computing systems for each time interval in the set of time intervals, wherein each power consumption target is equal to or greater than the minimum power threshold associated with each time interval.
providing instructions to the set of computing systems to perform one or more computational operations based on the performance strategy.	Austin Storms conceived of and/or developed technology that includes providing instructions to the set of computing systems to perform one or more computational operations based on the performance strategy, such as instructing miners to mine bitcoin.
18. The method of claim 17, wherein determining the performance strategy for the set of computing systems comprises:	
identifying information about the set of computing systems; and	Austin Storms conceived of and/or developed technology that includes a method including identifying information about the set of computing systems.
determining the performance strategy to further comprise instructions for at least a subset of the set of computing systems to operate at an increased frequency based on a combination of at least the portion of the power option data and the information about the set of computing systems.	Austin Storms conceived of and/or developed technology that includes a method including determining the performance strategy to further comprise instructions for at least a subset of the set of computing systems to operate at an increased frequency based on a combination of at least the portion of the power option data and the information about the set of computing systems.
19. The method of claim 17, further comprising:	
receiving subsequent power option data based, at least in part, on the power option agreement, wherein the subsequent power option data specify to decrease one or more minimum power thresholds of the set of minimum power thresholds;	Austin Storms conceived of and/or developed technology that includes a method including receiving subsequent power option data based, at least in part, on the power option agreement, wherein the subsequent power option data specify to decrease one or more minimum power thresholds of the set of minimum power thresholds.

responsive to receiving the subsequent power option data, modifying the performance strategy for the set of computing systems based on a combination of at least the portion of the subsequent power option data and at least one condition in the set of conditions, wherein the modified performance strategy comprises one or more reduced power consumption targets for the set of computing systems; and providing instructions to the set of computing systems to perform the one or more computational operations based on the modified performance strategy.	Austin Storms conceived of and/or developed technology that includes a method including, responsive to receiving the subsequent power option data, modifying the performance strategy for the set of computing systems based on a combination of at least the portion of the subsequent power option data and at least one condition in the set of conditions, wherein the modified performance strategy comprises one or more reduced power consumption targets for the set of computing systems; and providing instructions to the set of computing systems to perform the one or more computational operations based on the modified performance strategy.
20. A non-transitory computer readable medium having stored therein instructions executable by one or more processors to cause a computing system to perform functions comprising:	
monitoring a set of conditions;	Austin Storms conceived of and developed technology includes a computer system that monitors a set of conditions.
receiving power option data based, at least in part, on a power option agreement, wherein the power option data specify: (i) a set of minimum power thresholds, and (ii) a set of time intervals, wherein each minimum power threshold in the set of minimum power thresholds is associated with a time interval in the set of time intervals;	Austin Storms conceived of and/or developed technology that includes receiving power option data based, at least in part, on a power option agreement, wherein the power option data specify: (i) a set of minimum power thresholds, and (ii) a set of time intervals, wherein each minimum power threshold in the set of minimum power thresholds is associated with a time interval in the set of time intervals.

responsive to receiving the power option data, determining a performance strategy for a set of computing systems based on a combination of at least a portion of the power option data and at least one condition in the set of conditions, wherein the performance strategy comprises a power consumption target for the set of computing systems for each time interval in the set of time intervals, wherein each power consumption target is equal to or greater than the minimum power threshold associated with each time interval; and	Austin Storms conceived of and/or developed technology that includes, responsive to receiving the power option data, determining a performance strategy for a set of computing systems based on a combination of at least a portion of the power option data and at least one condition in the set of conditions, wherein the performance strategy comprises a power consumption target for the set of computing systems for each time interval in the set of time intervals, wherein each power consumption target is equal to or greater than the minimum power threshold associated with each time interval.
providing instructions to the set of computing systems to perform one or more computational operations based on the performance strategy.	Austin Storms conceived of and/or developed technology that includes providing instructions to the set of computing systems to perform one or more computational operations based on the performance strategy.

SUPPLEMENTAL ANSWER:

Subject to the foregoing, Plaintiff further responds that documents produced that are responsive to this request include, but are not limited to, BB00000001 – BB00000038 and BB00000040 – BB00000097. These documents identified by Plaintiff include interface screenshots, photographs of whiteboard notes, logic, and calculations, photographs of system hardware, mining profitability spreadsheets, .CSV files, system diagrams, and emails regarding the same. Additionally, the source code files listed in the Appendix hereto (BB_SC00000001-67) are responsive to this request and are available to Defendants for inspection.

U.S. Patent No. 10,608,433	Plaintiffs' Technology
1. A system comprising: a set of computing systems, wherein the set of computing systems is configured to	Austin Storms conceived of and developed technology that includes a system comprising a set of computing systems, wherein the set of computing

perform computational operations using power from a power grid;	systems is configured to perform computational operations using power from a power grid. *See, e.g.*, BB00000001-38, 40-97 (showing computing systems through screenshots of various interfaces, photos of hardware, and whiteboard notes and logic). For example, Mr. Storms developed software that constitutes a control system configured to perform computational operations using power from a power grid. Examples of this source code include the source code files available for inspection bearing production numbers BB_SC00000001-67. These source code files specifically reflect that Mr. Storms developed software that controls a set of computing systems configured to perform computational operations using power for a power grid, such as a set of miners to perform calculations to mine bitcoin. As reflected in the metadata of the source code, Mr. Storms developed this software no later than April 29, 2019.
a control system configured to: monitor a set of conditions;	Austin Storms conceived of and developed technology that includes a control system configured to monitor a set of conditions including at least real-time balancing market rate (RTBM) and day-ahead locational marginal pricing (DA LMP). *See, e.g.,* BB0000001-18, 21-28, 35-38, 45, 62 and 73-81 (showing control system through screenshots of various interfaces, photos of hardware, and whiteboard notes and logic); see also BB00000019-20, 29-34, 40-44, 46-61 and 63-72 (showing monitored conditions through mining profitability and related spreadsheets/.csv files, system diagrams and source code). For example, Mr. Storms developed software that constitutes a control system configured to monitor a set of conditions.

	Examples of this source code include the source code files available for inspection bearing production numbers BB_SC00000001-8, 11-40, 42, 45-67. These source code files specifically reflect that Mr. Storms developed software to monitor a set of conditions including the price of bitcoin, bitcoin hashrate, network difficulty, energy pricing and the like. As reflected in the metadata of the source code, Mr. Storms developed this software no later than April 29, 2019.
receive power option data based, at least in part, on a power option agreement, wherein the power option data specify: (i) a set of minimum power thresholds, and (ii) a set of time intervals, wherein each minimum power threshold in the set of minimum power thresholds is associated with a time interval in the set of time intervals;	Austin Storms conceived of and developed technology that includes receiving power option data based, at least in part, on a power option agreement, wherein the power option data specifies: (i) a set of minimum power thresholds, and (ii) a set of time intervals, wherein each minimum power threshold in the set of minimum power thresholds is associated with a time interval in the set of time intervals. For example, Mr. Storms' system used multiple time intervals, including the day-ahead hourly intervals and real-time 5-minute intervals, each of which included an associated minimum power threshold used in periodically determining performance strategies (i.e. every five minutes) and negotiating power purchasing arrangements with authorized entities (such as a fixed-duration power option agreement or the like). *See, e.g.,* BB0000001-18, 21-28, 35-38, 45, 62 and 73-81 (showing control system through screenshots of various interfaces, photos of hardware, and whiteboard notes and logic); see also BB00000019-20, 29-34, 40-44, 46-61 and 63-72 (showing monitored conditions through mining profitability and related spreadsheets/.csv files, system diagrams and source code). The systems also provided for fine grain load control (*i.e.* dynamically reducing load on demand) using proprietarily

	developed switching power distribution units configured to represent the physical power distribution unit and relay to which the miner IP address. *See, e.g.*, BB00000006. For example, Mr. Storms developed software that constitutes a control system configured to use multiple time intervals, including the day-ahead hourly intervals and real-time 5-minute intervals, each of which included an associated minimum power threshold used in periodically determining performance strategies (i.e. every five minutes) and negotiating power purchasing arrangements with authorized entities (such as a fixed-duration power option agreement or the like). Examples of this source code include the source code files available for inspection bearing production numbers BB_SC00000002, 4-5, 7-8, 11-40, 42-43. These source code files specifically reflect that Mr. Storms developed software that used multiple time intervals, including the day-ahead hourly intervals and real-time 5-minute intervals, each of which included an associated minimum power threshold used in periodically determining performance strategies (i.e. every five minutes) and negotiating power purchasing arrangements with authorized entities (such as a fixed-duration power option agreement or the like). *Id.*; s*ee, e.g.*, BB_SC00000043 (showing multiple power thresholds associated with miners performing at different capacities). As reflected in the metadata of the source code, Mr. Storms developed this software no later than April 29, 2019. In addition, this arrangement and set of data is dictated by the structure of a power option agreement, using a known, standard data format by which a QSE or other entity would send instructions (e.g.

	"1.2 MW from 0100-0200, 1.5 MW from 0200-0300, etc"). This aspect also is present in Mr. Storm's system via its fine grain load control aspects, described above.
responsive to receiving the power option data, determine a performance strategy for the set of computing systems based on a combination of at least a portion of the power option data and at least one condition in the set of conditions, wherein the performance strategy comprises a power consumption target for the set of computing systems for each time interval in the set of time intervals, wherein each power consumption target is equal to or greater than the minimum power threshold associated with each time interval; and	Austin Storms conceived of and developed technology that determines, responsive to receiving the power option data, a performance strategy for the set of computing systems based on a combination of at least a portion of the power option data and at least one condition in the set of conditions, wherein the performance strategy comprises a power consumption target for the set of computing systems for each time interval in the set of time intervals, wherein each power consumption target is equal to or greater than the minimum power threshold associated with each time interval. For example, Mr. Storms' system used multiple time intervals, including real-time as well as 5-minute and hourly, 24-hour day-ahead intervals, each of which included an associated minimum power threshold used in periodically determining performance strategies in negotiating power purchasing arrangements with authorized entities. *See, e.g.,* BB00000019-20, 29-34, 40-44, 46-61 and 63-72 (showing monitored conditions through mining profitability and related spreadsheets/.csv files, system diagrams and source code). The systems also provided for fine grain load control (*i.e.* dynamically reducing load on demand) using proprietarily developed switching power distribution units configured to represent the physical power distribution unit and relay to which the miner IP address. *See, e.g.*, BB00000006. For example, Mr. Storms developed software that determines a performance strategy for the set of computing systems based on a combination of at least a

	portion of the power option data and at least one condition in the set of conditions. Examples of this source code include the source code files available for inspection bearing production numbers BB_SC00000002, 4-5, 7-8, 11-40, 42-67. These source code files specifically reflect that Mr. Storms developed software that determines a performance strategy for multiple time intervals, including the day-ahead hourly intervals and real-time 5-minute intervals, each of which included an associated minimum power threshold used in periodically (i.e. every five minutes) determining performance strategies (such as strategies to mine Bitcoin and/or at what capacity, strategies to not mine Bitcoin, strategies to sell power to the grid, and the like), and negotiating power purchasing arrangements with authorized entities (such as a fixed-duration power option agreement or the like). *Id.*; s*ee, e.g.*, BB_SC00000043 (showing multiple power thresholds associated with miners performing at different capacities). As reflected in the metadata of the source code, Mr. Storms developed this software no later than April 29, 2019.
provide instructions to the set of computing systems to perform one or more computational operations based on the performance strategy.	Austin Storms conceived of and developed technology that includes providing instructions to the set of computing systems to perform one or more computational operations based on the performance strategy, such as instructing miners to mine bitcoin, instructing the miners to stop mining bitcoin, effecting a sale or other release of the energy to the grid, or other. *See, e.g.*, BB00000001-38, 40-97 (showing computing systems through screenshots of various interfaces, photos of hardware, and whiteboard notes and logic). The systems also provided for fine grain load control (*i.e.* dynamically

	reducing load on demand) using proprietarily developed switching power distribution units configured to represent the physical power distribution unit and relay to which the miner IP address. *See, e.g.,* BB00000006. For example, Mr. Storms developed software that provides instructions to the set of computing systems to perform one or more computational operations based on the performance strategy. Examples of this source code include the source code files available for inspection bearing production numbers BB_SC00000002, 4-8, 11-40, 42-67. These source code files specifically reflect that Mr. Storms developed software that provided instructions to the set of computing systems to perform one or more computational operations based multiple time intervals, including the day-ahead hourly intervals and real-time 5-minute intervals, each of which included an associated minimum power threshold used in periodically determining performance strategies (i.e. every five minutes) and negotiating power purchasing arrangements with authorized entities (such as a fixed-duration power option agreement or the like). *Id.*; s*ee, e.g.*, BB_SC00000043 (showing multiple power thresholds associated with miners performing at different capacities) . As reflected in the metadata of the source code, Mr. Storms developed this software no later than April 29, 2019.
2. The system of claim 1, wherein the control system is configured to monitor the set of conditions comprising:	
a price of power from the power grid; and	Austin Storms conceived of and developed technology that includes a control system configured to monitor a price of power from the power grid, such as least day-ahead and real-time power pricing. *See, e.g.,* BB00000019-20, 29-34,

	40-44, 46-61 and 63-72 (showing monitored conditions through mining profitability and related spreadsheets/.csv files, system diagrams and source code). For example, Mr. Storms developed software that monitors a price of power from the power grid, such as at least day-ahead and real-time power pricing. Examples of this source code include the source code files available for inspection bearing production numbers BB_SC00000002, 4-8, 11-40, 42-67. These source code files specifically reflect that Mr. Storms developed software that monitors a price of power from the power grid, such as least day-ahead and real-time power pricing. *Id*. As reflected in the metadata of the source code, Mr. Storms developed this software no later than April 29, 2019.
a plurality of parameters associated with one or more computational operations to be performed at the set of computing systems.	Austin Storms conceived of and developed technology that includes a control system configured to monitor a plurality of parameters associated with one or more computational operations to be performed at the set of computing systems, such as at least real-time Bitcoin-US Dollar exchange rate, Bitcoin network difficulty, and estimated Bitcoin network hashrate. *See, e.g.,* BB00000019-20, 29-34, 40-44, 46-61 and 63-72 (showing monitored conditions through mining profitability and related spreadsheets/.csv files, system diagrams and source code). For example, Mr. Storms developed software that monitors a plurality of parameters associated with one or more computational operations to be performed at the set of computing systems, such as at least real-time Bitcoin-US Dollar exchange rate, Bitcoin network difficulty, and estimated Bitcoin network hashrate. Examples of this source code include the

	source code files available for inspection bearing production numbers BB_SC00000001, 4-5, 7-8, 11-40, 42-67. These source code files specifically reflect that Mr. Storms developed software that monitors a plurality of parameters associated with one or more computational operations to be performed at the set of computing systems. *Id*. As reflected in the metadata of the source code, Mr. Storms developed this software no later than April 29, 2019.
3. The system of claim 2, wherein the control system is configured to:	
determine the performance strategy for the set of computing systems based on a combination of at least the portion option data, the price of power from the power grid, and the plurality of parameters associated with the one or more computational operations.	Austin Storms conceived of and developed technology that determine the performance strategy for the set of computing systems based on a combination of at least the portion option data, the price of power from the power grid, and the plurality of parameters associated with the one or more computational operations, as shown in the descriptions above for claims 1 and 2. *See, e.g.,* BB00000019-20, 29-34, 40-44, 46-61 and 63-72 (showing monitored conditions through mining profitability and related spreadsheets/.csv files, system diagrams and source code). For example, Mr. Storms developed software that determines a performance strategy for the set of computing systems based on a combination of at least the portion option data, the price of power from the power grid, and the plurality of parameters associated with the one or more computational operations. Examples of this source code include the source code files available for inspection bearing production numbers BB_SC00000002, 4-5, 7-8, 11-40, 42-67. These source code files specifically reflect that Mr. Storms developed software that determines a performance strategy at least

	the portion option data, the price of power from the power grid, and the plurality of parameters associated with the one or more computational operations. *Id*. As reflected in the metadata of the source code, Mr. Storms developed this software no later than April 29, 2019.
4. The system of claim 3, wherein the performance strategy further comprises:	
an order for the set of computing systems to follow when performing the one or more computational operations, wherein the order is based on respective priorities associated with the one or more computational operations.	Austin Storms conceived of and developed technology that includes a performance strategy that includes an order for the set of computing systems to follow when performing the one or more computational operations, wherein the order is based on respective priorities associated with the one or more computational operations. *See, e.g.,* BB00000019-20, 29-34, 40-44, 46-61 and 63-72 (showing monitored conditions through mining profitability and related spreadsheets/.csv files, system diagrams and source code). For example, Mr. Storms developed software that determines a performance strategy for the set of computing systems based on a combination of at least the portion option data, the price of power from the power grid, and the plurality of parameters associated with the one or more computational operations. Examples of this source code include the source code files available for inspection bearing production numbers BB_SC00000002, 4-5, 7-8, 11-40, 42-67. These source code files specifically reflect that Mr. Storms developed software that determines a performance strategy based on at least the portion option data, the price of power from the power grid, and the plurality of parameters associated with the one or more computational operations. *Id*. As reflected in the metadata of the

	source code, Mr. Storms developed this software no later than April 29, 2019.
5. The system of claim 4, wherein the performance strategy further comprises:	
at least one power consumption target that is greater than a minimum power threshold when the price of power from the power grid is below a threshold price during the time interval associated with the minimum power threshold.	Austin Storms conceived of and/or developed technology that includes a performance strategy that includes at least one power consumption target that is greater than a minimum power threshold when the price of power from the power grid is below a threshold price during the time interval associated with the minimum power threshold. *See, e.g.,* BB00000019-20, 29-34, 40-44, 46-61 and 63-72 (showing monitored conditions through mining profitability and related spreadsheets/.csv files, system diagrams and source code). For example, Mr. Storms developed software that uses at least one power consumption target that is greater than a minimum power threshold when the price of power from the power grid is below a threshold price during the time interval associated with the minimum power threshold. Examples of this source code include the source code files available for inspection bearing production numbers BB_SC00000002, 4-8, 11-40, 42-67. These source code files specifically reflect that Mr. Storms developed software that provided instructions to the set of computing systems to perform one or more computational operations based multiple time intervals, including the day-ahead hourly intervals and real-time 5-minute intervals, each of which included an associated minimum power threshold used in periodically determining performance strategies (i.e. every five minutes). *Id.*; s*ee, e.g.*, BB_SC00000043 (showing multiple power thresholds associated with miners performing at

	different capacities, including at targets greater than minimum thresholds). As reflected in the metadata of the source code, Mr. Storms developed this software no later than April 29, 2019.
6. The system of claim 1, wherein the control system is further configured to:	
receive subsequent power option data based, at least in part, on the power option agreement, wherein the subsequent power option data specify to decrease one or more minimum power thresholds of the set of minimum power thresholds.	Austin Storms conceived of and developed technology that includes a control system configured to receive subsequent power option data based, at least in part, on the power option agreement, wherein the subsequent power option data specify to decrease one or more minimum power thresholds of the set of minimum power thresholds. *See, e.g.,* BB00000019-20, 29-34, 40-44, 46-61 and 63-72 (showing monitored conditions through mining profitability and related spreadsheets/.csv files, system diagrams and source code). The systems also provided for fine grain load control (*i.e.* dynamically reducing load on demand) using proprietarily developed switching power distribution units configured to represent the physical power distribution unit and relay to which the miner IP address. *See, e.g.*, BB00000006. For example, Mr. Storms developed software that works under the framework of a power options agreement, which necessarily includes subsequent power option data based, at least in part, on the power option agreement, that can decrease one or more minimum power thresholds. Examples of this source code include the source code files available for inspection bearing production numbers BB_SC00000002, 4-8, 11-40, 42-67. These source code files specifically reflect that Mr. Storms developed software that provided instructions to the set of computing systems to perform one or more computational operations based multiple time intervals, including the day-

	ahead hourly intervals and real-time 5-minute intervals, each of which included an associated minimum power threshold used in periodically determining performance strategies (i.e. every five minutes) and negotiating power purchasing arrangements with authorized entities (such as a fixed-duration power option agreement or the like). *Id.*; s*ee, e.g.*, BB_SC00000043 (showing multiple power thresholds associated with miners performing at different capacities) . As reflected in the metadata of the source code, Mr. Storms developed this software no later than April 29, 2019.
7. The system of claim 6, wherein the control system is further configured to:	
responsive to receiving the subsequent power option data, modify the performance strategy for the set of computing systems based on a combination of at least the portion of the subsequent power option data and at least one condition in the set of conditions, wherein the modified performance strategy comprises one or more reduced power consumption targets for the set of computing systems.	Austin Storms conceived of and developed technology that includes a control system that is configured to responsive to receiving the subsequent power option data, modify the performance strategy for the set of computing systems based on a combination of at least the portion of the subsequent power option data and at least one condition in the set of conditions, wherein the modified performance strategy comprises one or more reduced power consumption targets for the set of computing systems, such as instructing a subset of miners to stop mining bitcoin. *See, e.g.,* BB00000019-20, 29-34, 40-44, 46-61 and 63-72 (showing monitored conditions through mining profitability and related spreadsheets/.csv files, system diagrams and source code). The systems also provided for fine grain load control (*i.e.* dynamically reducing load on demand) using proprietarily developed switching power distribution units configured to represent the physical power distribution unit and relay to which the miner IP address. *See, e.g.*, BB00000006.

	For example, Mr. Storms developed software that provides instructions to the set of computing systems to perform one or more computational operations based on the performance strategy. Examples of this source code include the source code files available for inspection bearing production numbers BB_SC00000002, 4-8, 11-40, 42-67. These source code files specifically reflect that Mr. Storms developed software that provided instructions to the set of computing systems to perform one or more computational operations based multiple time intervals, including the day-ahead hourly intervals and real-time 5-minute intervals, each of which included an associated minimum power threshold used in periodically determining performance strategies (i.e. every five minutes) and negotiating power purchasing arrangements with authorized entities (such as a fixed-duration power option agreement or the like). *Id.*; s*ee, e.g.*, BB_SC00000043 (showing multiple power thresholds associated with miners performing at different capacities) . As reflected in the metadata of the source code, Mr. Storms developed this software no later than April 29, 2019.
8. The system of claim 7, wherein the control system is further configured to:	
provide instructions to the set of computing systems to perform the one or more computational operations based on the modified performance strategy.	Austin Storms conceived of and developed technology that includes a control system configured to provide instructions to the set of computing systems to perform the one or more computational operations based on the modified performance strategy. *See, e.g.,* BB0000001-18, 21-28, 35-38, 45, 62 and 73-81 (showing control system through screenshots of various interfaces, photos of hardware, and whiteboard notes and logic); see also BB00000019-20, 29-34,

	40-44, 46-61 and 63-72 (showing monitored conditions through mining profitability and related spreadsheets/.csv files, system diagrams and source code). The systems also provided for fine grain load control (*i.e.* dynamically reducing load on demand) using proprietarily developed switching power distribution units configured to represent the physical power distribution unit and relay to which the miner IP address. *See, e.g.*, BB00000006. For example, Mr. Storms developed software that provides instructions to the set of computing systems to perform one or more computational operations based on the performance strategy. Examples of this source code include the source code files available for inspection bearing production numbers BB_SC00000002, 4-8, 11-40, 42-67. These source code files specifically reflect that Mr. Storms developed software that provided instructions to the set of computing systems to perform one or more computational operations based on multiple time intervals, including the day-ahead hourly intervals and real-time 5-minute intervals, each of which included an associated minimum power threshold used in periodically determining performance strategies (i.e. every five minutes) and negotiating power purchasing arrangements with authorized entities (such as a fixed-duration power option agreement or the like). *Id.*; s*ee, e.g.*, BB_SC00000043 (showing multiple power thresholds associated with miners performing at different capacities). As reflected in the metadata of the source code, Mr. Storms developed this software no later than April 29, 2019.
9. The system of claim 1, wherein the control system is a remote master control	Austin Storms conceived of and/or developed technology that includes a control system that is a remote master

system positioned remotely from the set of computing systems.	control system positioned remotely from the set of computing systems. For example, in one implementation, a control system was housed in the vestibule area separate from the mining machines. In addition, that system also enabled remote master control of the system via VNC Viewer or SSH tunnel. *See, e.g.*, BB_SC00000002 (showing remote calls to enable/disable individual miners); *see also*, BB_SC00000004-8, 11-40, 42-67.
10. The system of claim 1, wherein the control system is a mobile computing device.	Austin Storms conceived of and/or developed technology that includes a control system that is a mobile computing device, such as a laptop or desktop computer, Raspberry Pi, NVIDIA Jetson Nano, or other mobile computing device. *See, e.g.,* BB0000001-18, 21-28, 35-38, 45, 62 and 73-81 (showing control system through screenshots of various interfaces, photos of hardware, and whiteboard notes and logic); see also BB00000019-20, 29-34, 40-44, 46-61 and 63-72 (showing monitored conditions through mining profitability and related spreadsheets/.csv files, and system diagrams).
11. The system of claim 1, wherein the control system is configured to receive the power option data while monitoring the set of conditions.	Austin Storms conceived of and/or developed technology that includes a control system that is configured to receive the power option data while monitoring the set of conditions. For example, Mr. Storms' system continuously monitors at least real-time balancing market rate (RTBM) and day-ahead locational marginal pricing (DA LMP) and periodically determines performance strategies, in accordance with negotiated power purchasing arrangements with authorized entities, for multiple time intervals, including real-time as well as 5-minute and 24-hour look-ahead intervals, each of which included an associated minimum power threshold. *See, e.g.,* BB0000001-18, 21-28, 35-38, 45, 62 and 73-81 (showing control system through screenshots of

	various interfaces, photos of hardware, and whiteboard notes and logic); *see also* BB00000019-20, 29-34, 40-44, 46-61 and 63-72 (showing monitored conditions through mining profitability and related spreadsheets/.csv files, system diagrams and source code). For example, Mr. Storms developed software that is continuously monitoring conditions and power option data. Examples of this source code include the source code files available for inspection bearing production numbers BB_SC00000002, 4-8, 11-40, 42-67. These source code files specifically reflect that Mr. Storms developed software that provided instructions to the set of computing systems to perform one or more computational operations based multiple time intervals, including the day-ahead hourly intervals and real-time 5-minute intervals, each of which included an associated minimum power threshold used in periodically determining performance strategies (i.e. every five minutes) and negotiating power purchasing arrangements with authorized entities (such as a fixed-duration power option agreement or the like). *Id.*; s*ee, e.g.*, BB_SC00000043 (showing multiple power thresholds associated with miners performing at different capacities) . As reflected in the metadata of the source code, Mr. Storms developed this software no later than April 29, 2019.
12. The system of claim 1, wherein the control system is further configured to:	
provide a request to a qualified scheduling entity (QSE) to determine the power option agreement; and	Austin Storms conceived of and/or developed technology that includes a control system that is configured to provide a request to a qualified scheduling entity (QSE) to determine the power option agreement. For example, Mr. Storms system could communicate

	directly with Southwest Power Pool entities to retrieve data, and was designed to receive power in accordance with various power purchasing agreements (such as a fixed-duration power option agreement or the like), with the communication and coordination of a QSE.
receive power option data in response to providing the request to the QSE.	Austin Storms conceived of and/or developed technology that includes a control system that is configured to receive power option data in response to providing the request to the QSE. For example, Mr. Storms' system continuously monitors at least real-time balancing market rate (RTBM) and day-ahead locational marginal pricing (DA LMP) and periodically determines performance strategies, in accordance with negotiated power purchasing arrangements with authorized entities, for multiple time intervals, including real-time as well as 5-minute and 24-hour look-ahead intervals, each of which included an associated minimum power threshold. *See, e.g.,* BB0000001-18, 21-28, 35-38, 45, 62 and 73-81 (showing control system through screenshots of various interfaces, photos of hardware, and whiteboard notes and logic); *see also* BB00000019-20, 29-34, 40-44, 46-61 and 63-72 (showing monitored conditions through mining profitability and related spreadsheets/.csv files, system diagrams and source code). The systems also provided for fine grain load control (*i.e.* dynamically reducing load on demand) using proprietarily developed switching power distribution units configured to represent the physical power distribution unit and relay to which the miner IP address. *See, e.g.,* BB00000006.. For example, Mr. Storms developed software that constitutes a control system configured to use multiple time intervals,

	including the day-ahead hourly intervals and real-time 5-minute intervals, each of which included an associated minimum power threshold used in periodically determining performance strategies (i.e. every five minutes) and negotiating power purchasing arrangements with authorized entities (such as a fixed-duration power option agreement or the like). Examples of this source code include the source code files available for inspection bearing production numbers BB_SC00000002, 4-5, 7-8, 11-40, 42-43. These source code files specifically reflect that Mr. Storms developed software that used multiple time intervals, including the day-ahead hourly intervals and real-time 5-minute intervals, each of which included an associated minimum power threshold used in periodically determining performance strategies (i.e. every five minutes) and negotiating power purchasing arrangements with authorized entities (such as a fixed-duration power option agreement or the like). *Id*.; s*ee, e.g.*, BB_SC00000043 (showing multiple power thresholds associated with miners performing at different capacities). As reflected in the metadata of the source code, Mr. Storms developed this software no later than April 29, 2019.
13. The system of claim 1, wherein the power option data specify: (i) a first minimum power threshold associated with a first time interval in the set of time intervals, and (ii) a second minimum power threshold associated with a second time interval in the set of time intervals, wherein the second time interval is subsequent to the first time interval	Austin Storms conceived of and/or developed technology that includes power option data that specifies: (i) a first minimum power threshold associated with a first time interval in the set of time intervals, and (ii) a second minimum power threshold associated with a second time interval in the set of time intervals, wherein the second time interval is subsequent to the first time interval. For example, Mr. Storms' system periodically determines performance strategies, in accordance with negotiated power purchasing arrangements with authorized entities, for multiple time

	intervals, including real-time as well as 5-minute and 24-hour look-ahead intervals, each of which included an associated minimum power threshold. *See, e.g.,* BB0000001-18, 21-28, 35-38, 45, 62 and 73-81 (showing control system through screenshots of various interfaces, photos of hardware, and whiteboard notes and logic); *see also* BB00000019-20, 29-34, 40-44, 46-61 and 63-72 (showing monitored conditions through mining profitability and related spreadsheets/.csv files, system diagrams and source code); *see, e.g.,* BB_SC00000043 (showing multiple power thresholds associated with miners performing at different capacities at different time intervals). In addition, this arrangement and set of data is dictated by the structure of a power option agreement, using a known, standard data format by which a QSE or other entity would send instructions (e.g. "1.2 MW from 0100-0200, 1.5 MW from 0200-0300, etc"). This aspect also is present in Mr. Storm's system through fine grain load control, described above.
14. The system of claim 13, wherein the control system is configured to:	
determine the performance strategy for the set of computing systems such that the performance strategy comprises: a first power consumption target for the set of computing systems for the first time interval, wherein the first power consumption target is equal to or greater than the first minimum power threshold; and a second power consumption target for the set of computing systems for the second time interval, wherein the second power consumption target is equal to or greater than the second minimum power threshold.	Austin Storms conceived of and/or developed technology that includes a control system that is configured to determine the performance strategy for the set of computing systems such that the performance strategy comprises: a first power consumption target for the set of computing systems for the first time interval, wherein the first power consumption target is equal to or greater than the first minimum power threshold and a second power consumption target for the set of computing systems for the second time interval, wherein the second power consumption target is equal to or greater than the second minimum power threshold. For example, Mr. Storms'

	system continuously monitors at least real-time balancing market rate (RTBM) and day-ahead locational marginal pricing (DA LMP) and periodically determines performance strategies based on power consumption targets, in accordance with negotiated power purchasing arrangements with authorized entities, for multiple time intervals, including real-time as well as 5-minute and 24-hour look-ahead intervals, each of which included an associated minimum power threshold, such that a first *See, e.g.,* BB0000001-18, 21-28, 35-38, 45, 62 and 73-81 (showing control system through screenshots of various interfaces, photos of hardware, and whiteboard notes and logic); *see also* BB00000019-20, 29-34, 40-44, 46-61 and 63-72 (showing monitored conditions through mining profitability and related spreadsheets/.csv files, system diagrams and source code). The systems also provided for fine grain load control (*i.e.* dynamically reducing load on demand) using proprietarily developed switching power distribution units configured to represent the physical power distribution unit and relay to which the miner IP address. *See, e.g.,* BB00000006. For example, Mr. Storms developed software that constitutes a control system configured to use multiple time intervals, including the day-ahead hourly intervals and real-time 5-minute intervals, each of which included an associated minimum power threshold used in periodically determining performance strategies (i.e. every five minutes) and negotiating power purchasing arrangements with authorized entities (such as a fixed-duration power option agreement or the like). Examples of this source code include the source code files available for inspection bearing production numbers BB_SC00000002, 4-

	5, 7-8, 11-40, 42-43. These source code files specifically reflect that Mr. Storms developed software that used multiple time intervals, including the day-ahead hourly intervals and real-time 5-minute intervals, each of which included an associated minimum power threshold used in periodically determining performance strategies (i.e. every five minutes) and negotiating power purchasing arrangements with authorized entities (such as a fixed-duration power option agreement or the like). *Id.*; s*ee, e.g.*, BB_SC00000043 (showing multiple power thresholds associated with miners performing at different capacities at different time intervals). As reflected in the metadata of the source code, Mr. Storms developed this software no later than April 29, 2019.
15. The system of claim 1, wherein a total duration of the set of time intervals corresponds to a twenty-four hour period.	Austin Storms conceived of and/or developed technology that includes calculations performed such that a total duration of the set of time intervals corresponds to a twenty-four hour period, for example, to correspond to a time interval appropriate for an analysis using the DA LMP. *See, e.g.,* BB00000019-20, 29-34, 40-44, 46-61 and 63-72 (showing monitored conditions through mining profitability and related spreadsheets/.csv files, system diagrams and source code).
16. The system of claim 1, wherein the set of conditions monitored by the control system further comprise:	
a price of power from the power grid; and a global mining hash rate and a price for a cryptocurrency; and	Austin Storms conceived of and developed technology that includes a control system that monitors a price of power from the power grid, a global mining hash rate and a price for a cryptocurrency. *See, e.g.,* BB00000019-20, 29-34, 40-44, 46-61 and 63-72 (showing monitored conditions through mining profitability and related

	spreadsheets/.csv files, system diagrams and source code). For example, Mr. Storms developed software that constitutes a control system configured to monitor a set of conditions including a price of power from the power grid, and a global mining hash rate and a price for a cryptocurrency. Examples of this source code include the source code files available for inspection bearing production numbers BB_SC00000001-8, 11-40, 42, 45-67. These source code files specifically reflect that Mr. Storms developed software to monitor a set of conditions including the price of bitcoin, bitcoin hashrate, network difficulty, energy pricing and the like. As reflected in the metadata of the source code, Mr. Storms developed this software no later than April 29, 2019.
wherein the control system is configured to: determine the performance strategy for the set of computing systems based on a combination of at the portion of the power option data, the price of power from the power grid, the global mining hash rate and the price for the cryptocurrency, wherein the performance strategy specifies for at least a subset of the set of computing systems to perform mining operations for the cryptocurrency when the price of power from the power grid is equal to or less than a revenue obtained by performing the mining operations for the cryptocurrency.	Austin Storms conceived of and/or developed technology that includes a control system configured to determine the performance strategy for the set of computing systems based on a combination of at the portion of the power option data, the price of power from the power grid, the global mining hash rate and the price for the cryptocurrency, wherein the performance strategy specifies for at least a subset of the set of computing systems to perform mining operations for the cryptocurrency when the price of power from the power grid is equal to or less than a revenue obtained by performing the mining operations for the cryptocurrency. *See, e.g.,* BB00000019-20, 29-34, 40-44, 46-61 and 63-72 (showing monitored conditions through mining profitability and related spreadsheets/.csv files, system diagrams and source code).

	For example, Mr. Storms developed software that determines a performance strategy for the set of computing systems based on a combination of at least a portion of the power option data and at least one condition in the set of conditions. Examples of this source code include the source code files available for inspection bearing production numbers BB_SC00000002, 4-5, 7-8, 11-40, 42-67. These source code files specifically reflect that Mr. Storms developed software that determines a performance strategy for multiple time intervals, including the day-ahead hourly intervals and real-time 5-minute intervals, each of which included an associated minimum power threshold used in periodically (i.e. every five minutes) determining performance strategies (such as strategies to mine Bitcoin and/or at what capacity, strategies to not mine Bitcoin, strategies to sell power to the grid, and the like), and negotiating power purchasing arrangements with authorized entities (such as a fixed-duration power option agreement or the like). *Id.*; s*ee, e.g.*, BB_SC00000043 (showing multiple power thresholds associated with miners performing at different capacities). As reflected in the metadata of the source code, Mr. Storms developed this software no later than April 29, 2019. The systems also provided for fine grain load control (*i.e.* dynamically reducing load on demand) using proprietarily developed switching power distribution units configured to represent the physical power distribution unit and relay to which the miner IP address. *See, e.g.*, BB00000006. In addition, this arrangement and set of data is dictated by the structure of a power option agreement.
17. A method comprising:	

monitoring, by a computing system, a set of conditions;	Austin Storms conceived of and developed technology that includes a control system configured to monitor a set of conditions including at least real-time balancing market rate (RTBM) and day-ahead locational marginal pricing (DA LMP). *See, e.g.,* BB0000001-18, 21-28, 35-38, 45, 62 and 73-81 (showing control system through screenshots of various interfaces, photos of hardware, and whiteboard notes and logic); see also BB00000019-20, 29-34, 40-44, 46-61 and 63-72 (showing monitored conditions through mining profitability and related spreadsheets/.csv files, system diagrams and source code). For example, Mr. Storms developed software that constitutes a control system configured to monitor a set of conditions. Examples of this source code include the source code files available for inspection bearing production numbers BB_SC00000001-8, 11-40, 42, 45-67. These source code files specifically reflect that Mr. Storms developed software to monitor a set of conditions including the price of bitcoin, bitcoin hashrate, network difficulty, energy pricing and the like. As reflected in the metadata of the source code, Mr. Storms developed this software no later than April 29, 2019.
receiving, at the computing system, power option data based, at least in part, on a power option agreement, wherein the power option data specify: (i) a set of minimum power thresholds, and (ii) a set of time intervals, wherein each minimum power threshold in the set of minimum power thresholds is associated with a time interval in the set of time intervals;	Austin Storms conceived of and developed technology that includes receiving power option data based, at least in part, on a power option agreement, wherein the power option data specifies: (i) a set of minimum power thresholds, and (ii) a set of time intervals, wherein each minimum power threshold in the set of minimum power thresholds is associated with a time interval in the set of time intervals. For example, Mr. Storms' system used multiple time intervals, including the day-ahead hourly intervals and real-time 5-minute intervals,

	each of which included an associated minimum power threshold used in periodically determining performance strategies (i.e. every five minutes) and negotiating power purchasing arrangements with authorized entities (such as a fixed-duration power option agreement or the like). *See, e.g.,* BB0000001-18, 21-28, 35-38, 45, 62 and 73-81 (showing control system through screenshots of various interfaces, photos of hardware, and whiteboard notes and logic); see also BB00000019-20, 29-34, 40-44, 46-61 and 63-72 (showing monitored conditions through mining profitability and related spreadsheets/.csv files, system diagrams and source code). The systems also provided for fine grain load control (*i.e.* dynamically reducing load on demand) using proprietarily developed switching power distribution units configured to represent the physical power distribution unit and relay to which the miner IP address. *See, e.g.*, BB00000006. For example, Mr. Storms developed software that constitutes a control system configured to use multiple time intervals, including the day-ahead hourly intervals and real-time 5-minute intervals, each of which included an associated minimum power threshold used in periodically determining performance strategies (i.e. every five minutes) and negotiating power purchasing arrangements with authorized entities (such as a fixed-duration power option agreement or the like). Examples of this source code include the source code files available for inspection bearing production numbers BB_SC00000002, 4-5, 7-8, 11-40, 42-43. These source code files specifically reflect that Mr. Storms developed software that used multiple time intervals, including the day-ahead hourly intervals and real-time 5-minute

	intervals, each of which included an associated minimum power threshold used in periodically determining performance strategies (i.e. every five minutes) and negotiating power purchasing arrangements with authorized entities (such as a fixed-duration power option agreement or the like). *Id*.; s*ee, e.g.*, BB_SC00000043 (showing multiple power thresholds associated with miners performing at different capacities). As reflected in the metadata of the source code, Mr. Storms developed this software no later than April 29, 2019. In addition, this arrangement and set of data is dictated by the structure of a power option agreement, using a known, standard data format by which a QSE or other entity would send instructions (e.g. "1.2 MW from 0100-0200, 1.5 MW from 0200-0300, etc"). This aspect also is present in Mr. Storm's system via its fine grain load control aspects, described above.
responsive to receiving the power option data, determining a performance strategy for a set of computing systems based on a combination of at least a portion of the power option data and at least one condition in the set of conditions, wherein the performance strategy comprises a power consumption target for the set of computing systems for each time interval in the set of time intervals, wherein each power consumption target is equal to or greater than the minimum power threshold associated with each time interval; and	Austin Storms conceived of and developed technology that determines, responsive to receiving the power option data, a performance strategy for the set of computing systems based on a combination of at least a portion of the power option data and at least one condition in the set of conditions, wherein the performance strategy comprises a power consumption target for the set of computing systems for each time interval in the set of time intervals, wherein each power consumption target is equal to or greater than the minimum power threshold associated with each time interval. For example, Mr. Storms' system used multiple time intervals, including real-time as well as 5-minute and hourly, 24-hour day-ahead intervals, each of which included an associated minimum power threshold used in periodically determining

	performance strategies in negotiating power purchasing arrangements with authorized entities. *See, e.g.,* BB00000019-20, 29-34, 40-44, 46-61 and 63-72 (showing monitored conditions through mining profitability and related spreadsheets/.csv files, system diagrams and source code). The systems also provided for fine grain load control (*i.e.* dynamically reducing load on demand) using proprietarily developed switching power distribution units configured to represent the physical power distribution unit and relay to which the miner IP address. *See, e.g.,* BB00000006. For example, Mr. Storms developed software that determines a performance strategy for the set of computing systems based on a combination of at least a portion of the power option data and at least one condition in the set of conditions. Examples of this source code include the source code files available for inspection bearing production numbers BB_SC00000002, 4-5, 7-8, 11-40, 42-67. These source code files specifically reflect that Mr. Storms developed software that determines a performance strategy for multiple time intervals, including the day-ahead hourly intervals and real-time 5-minute intervals, each of which included an associated minimum power threshold used in periodically (i.e. every five minutes) determining performance strategies (such as strategies to mine Bitcoin and/or at what capacity, strategies to not mine Bitcoin, strategies to sell power to the grid, and the like), and negotiating power purchasing arrangements with authorized entities (such as a fixed-duration power option agreement or the like). *Id.*; s*ee, e.g.*, BB_SC00000043 (showing multiple power thresholds associated with miners performing at different capacities). As

	reflected in the metadata of the source code, Mr. Storms developed this software no later than April 29, 2019.
providing instructions to the set of computing systems to perform one or more computational operations based on the performance strategy.	Austin Storms conceived of and developed technology that includes providing instructions to the set of computing systems to perform one or more computational operations based on the performance strategy, such as instructing miners to mine bitcoin, instructing the miners to stop mining bitcoin, effecting a sale or other release of the energy to the grid, or other. *See, e.g.*, BB00000001-38, 40-97 (showing computing systems through screenshots of various interfaces, photos of hardware, and whiteboard notes and logic).). The systems also provided for fine grain load control (*i.e.* dynamically reducing load on demand) using proprietarily developed switching power distribution units configured to represent the physical power distribution unit and relay to which the miner IP address. *See, e.g.,* BB00000006. For example, Mr. Storms developed software that provides instructions to the set of computing systems to perform one or more computational operations based on the performance strategy. Examples of this source code include the source code files available for inspection bearing production numbers BB_SC00000002, 4-8, 11-40, 42-67. These source code files specifically reflect that Mr. Storms developed software that provided instructions to the set of computing systems to perform one or more computational operations based multiple time intervals, including the day-ahead hourly intervals and real-time 5-minute intervals, each of which included an associated minimum power threshold used in periodically determining performance

	strategies (i.e. every five minutes) and negotiating power purchasing arrangements with authorized entities (such as a fixed-duration power option agreement or the like). *Id.*; s*ee, e.g.*, BB_SC00000043 (showing multiple power thresholds associated with miners performing at different capacities) . As reflected in the metadata of the source code, Mr. Storms developed this software no later than April 29, 2019.
18. The method of claim 17, wherein determining the performance strategy for the set of computing systems comprises:	
identifying information about the set of computing systems; and	Austin Storms conceived of and/or developed technology that includes a method including identifying information about the set of computing systems. *See, e.g.,* BB00000019-20, 29-34, 40-44, 46-61 and 63-72 (showing monitored conditions and information about the set of computer systems through mining profitability and related spreadsheets/.csv files, system diagrams and source code). The systems also provided for fine grain load control (*i.e.* dynamically reducing load on demand) using proprietarily developed switching power distribution units configured to represent the physical power distribution unit and relay to which the miner IP address. *See, e.g.,* BB00000006. For example, Mr. Storms developed software that constitutes a control system configured to use multiple time intervals, including the day-ahead hourly intervals and real-time 5-minute intervals, each of which included an associated minimum power threshold used in periodically determining performance strategies (i.e. every five minutes) and negotiating power purchasing arrangements with authorized entities (such as a fixed-duration power option agreement or the like). Examples of this source code include the source

	code files available for inspection bearing production numbers BB_SC00000002, 4-5, 7-8, 11-40, 42-43. These source code files specifically reflect that Mr. Storms developed software that used multiple time intervals, including the day-ahead hourly intervals and real-time 5-minute intervals, each of which included an associated minimum power threshold used in periodically determining performance strategies (i.e. every five minutes) and negotiating power purchasing arrangements with authorized entities (such as a fixed-duration power option agreement or the like). *Id.*; s*ee, e.g.*, BB_SC00000043 (showing multiple power thresholds associated with miners performing at different capacities). As reflected in the metadata of the source code, Mr. Storms developed this software no later than April 29, 2019.
determining the performance strategy to further comprise instructions for at least a subset of the set of computing systems to operate at an increased frequency based on a combination of at least the portion of the power option data and the information about the set of computing systems.	Austin Storms conceived of and/or developed technology that includes a method including determining the performance strategy to further comprise instructions for at least a subset of the set of computing systems to operate at an increased frequency based on a combination of at least the portion of the power option data and the information about the set of computing systems. *See, e.g.,* BB00000019-20, 29-34, 40-44, 46-61 and 63-72 (showing monitored conditions through mining profitability and related spreadsheets/.csv files, system diagrams and source code); *see also* BB00000001-38, 40-97 (showing computing systems through screenshots of various interfaces, photos of hardware, and whiteboard notes and logic). The systems also provided for fine grain load control (*i.e.* dynamically reducing load on demand) using proprietarily developed switching power distribution units configured to represent the physical power

	distribution unit and relay to which the miner IP address. *See, e.g.,* BB00000006. For example, Mr. Storms developed software that determines a performance strategy for the set of computing systems based on a combination of at least a portion of the power option data and at least one condition in the set of conditions. Examples of this source code include the source code files available for inspection bearing production numbers BB_SC00000002, 4-5, 7-8, 11-40, 42-67. These source code files specifically reflect that Mr. Storms developed software that determines a performance strategy for multiple time intervals, including the day-ahead hourly intervals and real-time 5-minute intervals, each of which included an associated minimum power threshold used in periodically (i.e. every five minutes) determining performance strategies (such as strategies to mine Bitcoin and/or at what capacity, strategies to not mine Bitcoin, strategies to sell power to the grid, and the like), and negotiating power purchasing arrangements with authorized entities (such as a fixed-duration power option agreement or the like). *Id.*; s*ee, e.g.*, BB_SC00000043 (showing multiple power thresholds associated with miners performing at different capacities). As reflected in the metadata of the source code, Mr. Storms developed this software no later than April 29, 2019.
19. The method of claim 17, further comprising:	
receiving subsequent power option data based, at least in part, on the power option agreement, wherein the subsequent power option data specify to decrease one or more minimum power thresholds of the set of minimum power thresholds;	Austin Storms conceived of and/or developed technology that includes a method including receiving subsequent power option data based, at least in part, on the power option agreement, wherein the subsequent power option data specify to decrease one or more minimum power

	thresholds of the set of minimum power thresholds. *See, e.g.,* BB0000001-18, 21-28, 35-38, 45, 62 and 73-81 (showing control system through screenshots of various interfaces, photos of hardware, and whiteboard notes and logic); see also BB00000019-20, 29-34, 40-44, 46-61 and 63-72 (showing monitored conditions through mining profitability and related spreadsheets/.csv files, system diagrams and source code). In addition, this arrangement and set of data is dictated by the structure of a power option agreement, using a known, standard data format by which a QSE or other entity would send instructions (e.g. "1.2 MW from 0100-0200, 1.5 MW from 0200-0300, etc"). This aspect also is present in Mr. Storm's system via its fine grain load control aspects, described above.
responsive to receiving the subsequent power option data, modifying the performance strategy for the set of computing systems based on a combination of at least the portion of the subsequent power option data and at least one condition in the set of conditions, wherein the modified performance strategy comprises one or more reduced power consumption targets for the set of computing systems; and providing instructions to the set of computing systems to perform the one or more computational operations based on the modified performance strategy.	Austin Storms conceived of and/or developed technology that includes a method including, responsive to receiving the subsequent power option data, modifying the performance strategy for the set of computing systems based on a combination of at least the portion of the subsequent power option data and at least one condition in the set of conditions, wherein the modified performance strategy comprises one or more reduced power consumption targets for the set of computing systems; and providing instructions to the set of computing systems to perform the one or more computational operations based on the modified performance strategy. *See, e.g.,* BB00000019-20, 29-34, 40-44, 46-61 and 63-72 (showing monitored conditions through mining profitability and related spreadsheets/.csv files, system diagrams and source code). The systems also provided for fine grain load control (*i.e.* dynamically reducing load on demand) using proprietarily developed switching power distribution units configured to

	represent the physical power distribution unit and relay to which the miner IP address. *See, e.g.*, BB00000006. For example, Mr. Storms developed software that determines a performance strategy for the set of computing systems based on a combination of at least a portion of the power option data and at least one condition in the set of conditions. Examples of this source code include the source code files available for inspection bearing production numbers BB_SC00000002, 4-5, 7-8, 11-40, 42-67. These source code files specifically reflect that Mr. Storms developed software that determines a performance strategy for multiple time intervals, including the day-ahead hourly intervals and real-time 5-minute intervals, each of which included an associated minimum power threshold used in periodically (i.e. every five minutes) determining performance strategies (such as strategies to mine Bitcoin and/or at what capacity, strategies to not mine Bitcoin, strategies to sell power to the grid, and the like), and negotiating power purchasing arrangements with authorized entities (such as a fixed-duration power option agreement or the like). *Id.*; s*ee, e.g.*, BB_SC00000043 (showing multiple power thresholds associated with miners performing at different capacities). As reflected in the metadata of the source code, Mr. Storms developed this software no later than April 29, 2019.
20. A non-transitory computer readable medium having stored therein instructions executable by one or more processors to cause a computing system to perform functions comprising:	
monitoring a set of conditions;	Austin Storms conceived of and developed technology that includes a control system configured to monitor a set

	of conditions including at least real-time balancing market rate (RTBM) and day-ahead locational marginal pricing (DA LMP). *See, e.g.*, BB00000019-20, 29-34, 40-44, 46-61 and 63-72 (showing monitored conditions through mining profitability and related spreadsheets/.csv files, system diagrams and source code). For example, Mr. Storms developed software that constitutes a control system configured to monitor a set of conditions. Examples of this source code include the source code files available for inspection bearing production numbers BB_SC00000001-8, 11-40, 42, 45-67. These source code files specifically reflect that Mr. Storms developed software to monitor a set of conditions including the price of bitcoin, bitcoin hashrate, network difficulty, energy pricing and the like. As reflected in the metadata of the source code, Mr. Storms developed this software no later than April 29, 2019.
receiving power option data based, at least in part, on a power option agreement, wherein the power option data specify: (i) a set of minimum power thresholds, and (ii) a set of time intervals, wherein each minimum power threshold in the set of minimum power thresholds is associated with a time interval in the set of time intervals;	Austin Storms conceived of and developed technology that includes receiving power option data based, at least in part, on a power option agreement, wherein the power option data specifies: (i) a set of minimum power thresholds, and (ii) a set of time intervals, wherein each minimum power threshold in the set of minimum power thresholds is associated with a time interval in the set of time intervals. For example, Mr. Storms' system used multiple time intervals, including the day-ahead hourly intervals and real-time 5-minute intervals, each of which included an associated minimum power threshold used in periodically determining performance strategies (i.e. every five minutes) and negotiating power purchasing arrangements with authorized entities (such as a fixed-duration power option agreement or the like). *See, e.g.,* BB0000001-18, 21-28, 35-38, 45, 62 and

	73-81 (showing control system through screenshots of various interfaces, photos of hardware, and whiteboard notes and logic); see also BB00000019-20, 29-34, 40-44, 46-61 and 63-72 (showing monitored conditions through mining profitability and related spreadsheets/.csv files, system diagrams and source code). The systems also provided for fine grain load control (*i.e.* dynamically reducing load on demand) using proprietarily developed switching power distribution units configured to represent the physical power distribution unit and relay to which the miner IP address. *See, e.g.,* BB00000006. For example, Mr. Storms developed software that constitutes a control system configured to use multiple time intervals, including the day-ahead hourly intervals and real-time 5-minute intervals, each of which included an associated minimum power threshold used in periodically determining performance strategies (i.e. every five minutes) and negotiating power purchasing arrangements with authorized entities (such as a fixed-duration power option agreement or the like). Examples of this source code include the source code files available for inspection bearing production numbers BB_SC00000002, 4-5, 7-8, 11-40, 42-43. These source code files specifically reflect that Mr. Storms developed software that used multiple time intervals, including the day-ahead hourly intervals and real-time 5-minute intervals, each of which included an associated minimum power threshold used in periodically determining performance strategies (i.e. every five minutes) and negotiating power purchasing arrangements with authorized entities (such as a fixed-duration power option agreement or the like). *Id.*; s*ee, e.g.*, BB_SC00000043 (showing multiple

	power thresholds associated with miners performing at different capacities). As reflected in the metadata of the source code, Mr. Storms developed this software no later than April 29, 2019. In addition, this arrangement and set of data is dictated by the structure of a power option agreement, using a known, standard data format by which a QSE or other entity would send instructions (e.g. "1.2 MW from 0100-0200, 1.5 MW from 0200-0300, etc"). This aspect also is present in Mr. Storm's system via its fine grain load control aspects, described above.
responsive to receiving the power option data, determining a performance strategy for a set of computing systems based on a combination of at least a portion of the power option data and at least one condition in the set of conditions, wherein the performance strategy comprises a power consumption target for the set of computing systems for each time interval in the set of time intervals, wherein each power consumption target is equal to or greater than the minimum power threshold associated with each time interval; and	Austin Storms conceived of and developed technology that determines, responsive to receiving the power option data, a performance strategy for the set of computing systems based on a combination of at least a portion of the power option data and at least one condition in the set of conditions, wherein the performance strategy comprises a power consumption target for the set of computing systems for each time interval in the set of time intervals, wherein each power consumption target is equal to or greater than the minimum power threshold associated with each time interval. For example, Mr. Storms' system used multiple time intervals, including real-time as well as 5-minute and hourly, 24-hour day-ahead intervals, each of which included an associated minimum power threshold used in periodically determining performance strategies in negotiating power purchasing arrangements with authorized entities. *See, e.g.,* BB00000019-20, 29-34, 40-44, 46-61 and 63-72 (showing monitored conditions through mining profitability and related spreadsheets/.csv files, system diagrams and source code). The systems also provided for fine grain load control (*i.e.*

	dynamically reducing load on demand) using proprietarily developed switching power distribution units configured to represent the physical power distribution unit and relay to which the miner IP address. *See, e.g.,* BB00000006. For example, Mr. Storms developed software that determines a performance strategy for the set of computing systems based on a combination of at least a portion of the power option data and at least one condition in the set of conditions. Examples of this source code include the source code files available for inspection bearing production numbers BB_SC00000002, 4-5, 7-8, 11-40, 42-67. These source code files specifically reflect that Mr. Storms developed software that determines a performance strategy for multiple time intervals, including the day-ahead hourly intervals and real-time 5-minute intervals, each of which included an associated minimum power threshold used in periodically (i.e. every five minutes) determining performance strategies (such as strategies to mine Bitcoin and/or at what capacity, strategies to not mine Bitcoin, strategies to sell power to the grid, and the like), and negotiating power purchasing arrangements with authorized entities (such as a fixed-duration power option agreement or the like). *Id.*; s*ee, e.g.*, BB_SC00000043 (showing multiple power thresholds associated with miners performing at different capacities). As reflected in the metadata of the source code, Mr. Storms developed this software no later than April 29, 2019.
providing instructions to the set of computing systems to perform one or more computational operations based on the performance strategy.	Austin Storms conceived of and developed technology that includes providing instructions to the set of computing systems to perform one or

	more computational operations based on the performance strategy, such as instructing miners to mine bitcoin, instructing the miners to stop mining bitcoin, effecting a sale or other release of the energy to the grid, or other. *See, e.g.*, BB00000001-38, 40-97 (showing computing systems through screenshots of various interfaces, photos of hardware, and whiteboard notes and logic). The systems also provided for fine grain load control (*i.e.* dynamically reducing load on demand) using proprietarily developed switching power distribution units configured to represent the physical power distribution unit and relay to which the miner IP address. *See, e.g.*, BB00000006. For example, Mr. Storms developed software that provides instructions to the set of computing systems to perform one or more computational operations based on the performance strategy. Examples of this source code include the source code files available for inspection bearing production numbers BB_SC00000002, 4-8, 11-40, 42-67. These source code files specifically reflect that Mr. Storms developed software that provided instructions to the set of computing systems to perform one or more computational operations based multiple time intervals, including the day-ahead hourly intervals and real-time 5-minute intervals, each of which included an associated minimum power threshold used in periodically determining performance strategies (i.e. every five minutes) and negotiating power purchasing arrangements with authorized entities (such as a fixed-duration power option agreement or the like). *Id.*; see, *e.g.*, BB_SC00000043 (showing multiple power thresholds associated with miners performing at different capacities) . As

	reflected in the metadata of the source code, Mr. Storms developed this software no later than April 29, 2019.

Interrogatory No. 4:

For each claim of the '632 Application, state with particularity each aspect of the BearBox Technology that does not fall within the scope of the '632 Application disclosure and describe with particularity why it does not, including but not limited to, those aspects denied in your Answer to Defendant's Counterclaims at, e.g., paragraphs 61-72 and 76-82.

ANSWER:

Plaintiffs incorporate their General Objection related to Defendants' definition of BearBox Technology, which is incorrect. Plaintiffs object to Interrogatory No. 4 as vague and ambiguous, at least with respect to the phrases "for each claim," "with particularity," and "any documents." Plaintiffs further object to Interrogatory No. 4 as overbroad, to the extent it asks for information regarding technology developed by the Plaintiffs that is not subject matter claimed in the '433 Patent. Plaintiffs further object that paragraphs 61-72 and 76-82 do not allege any particular scope of any claim of the '632 Application and, on that basis, Plaintiffs do not understand Interrogatory No. 4 and therefore cannot respond to it.

Subject to these objections and their General Objections, Plaintiffs respond that its Answer to Defendants' Counterclaims deny specifically the subject matter that is not disclosed in the '632 Application. For example, in paragraph 62, Plaintiffs state that "the '632 Application [does not use] the term 'energy efficient' or 'cryptocurrency mining systems.'" Generally, the '632 Application fails to disclose that which was cited by the United States Patent & Trademark Office in the January 27, 2020 Notice of Allowance of claims 1-20 of the '433 Patent, in particular the "examiner's statement of reasons for allowance" of those claims, including at least a failure to disclose a system for receiving power option data based, at least in part, on a power option agreement, wherein the power option data specify: (i) a set of minimum power thresholds

and (ii) a set of time intervals, wherein each minimum power threshold in the set of minimum power thresholds is associated with a time interval in the set of time intervals; a failure to disclose a system, responsive to receiving the power option data, for determining a performance strategy for the set of computing systems based on a combination of at least a portion of the power option data and at least one condition in the set of conditions, wherein the performance strategy comprises a power consumption target for the set of computing systems for each time interval in the set of time intervals, wherein each power consumption target is equal to or greater than the minimum power threshold associated with each time interval; and a failure to disclose providing instructions to the set of computing systems to perform one or more computation operations based on the performance strategy.

Interrogatory No. 5:

Describe with particularity all aspects of the BearBox Technology that have been deployed in use by Plaintiffs or by others with Plaintiffs' permission, including in your response the dates of use of each aspect and the party using the particular aspect.

ANSWER:

Plaintiffs incorporate their General Objection related to Defendants' definition of BearBox Technology, which is incorrect. Plaintiffs object to Interrogatory No. 5 as vague and ambiguous, at least with respect to the phrases "all aspects," and "with particularity." Plaintiffs further object to Interrogatory No. 5 as overbroad, to the extent it asks for information regarding technology developed by the Plaintiffs that is not subject matter claimed in the '433 Patent.

Subject to these objections and their General Objections, Plaintiffs respond that Mr. Storms built a system that practiced the inventions as claimed in one or more claims of the '433 patent, based on his conception of the inventions as claimed in the '433 patent, and that system was operational on or about April 21, 2019, and was used only by BearBox and Mr. Storms. Plaintiffs further respond that Plaintiffs built no other systems practicing the inventions claimed

in the ’433 patent, nor did Plaintiffs, at any time, give permission to any other party to build or use any system practicing the inventions as claimed in the ’433 patent.

SUPPLEMENTAL ANSWER:

Subject to the foregoing, Plaintiffs further respond that the system deployed by Mr. Austin Storms on or about April 21, 2019 practiced the inventions as described in claims 1-20 of the ’433 patent, and further include features not claimed in the ’433 patent, but described in the ’433 patent, such as (1) the use of a behind-the-meter (BTM) power generation source(s), (2) the use of various power purchasing mechanism(s), including various types of power purchasing mechanism(s) offered by ERCOT, MISO, SPP, and/or other ISOs, (3) the use of periodic or updated data relating to power prices, power usage, cryptocurrency information (including current exchange pricing, hash rate, network difficulty, and the like), (4) modifying power usage based on monitored data and power prices, (5) monitoring conditions such as (i) a price of power from a power grid, (ii) a plurality of parameters associated with a set of computational operations to be performed at the set of computing systems, and (iii) a plurality of parameters associated with the set of computing systems, (6) applying various weights to data in determining a mining strategy, which were later claimed in U.S. Patent Nos. 11,016,458 and/or 11,031,783. Plaintiffs further respond that the system deployed by Mr. Austin Storms includes features not known by Plaintiffs to be claimed in a Lancium patent, or patent application, including the use of various power purchasing arrangement(s) not described or claimed in the ’433, ’458 or ’783 Patents, including various types of power purchasing arrangements offered by ERCOT and/or other power supply entities.

Interrogatory No. 6:

Identify when and in what manner Plaintiffs learned of each of Defendants’ Patents.

ANSWER:

Plaintiffs object to Interrogatory No. 6 to the extent it calls for information protected by the attorney-client privilege or work-product doctrine. Plaintiffs object to Interrogatory No. 6 as overbroad, at least with respect to the phrases "in what manner." Plaintiffs further object to Interrogatory No. 6 as overbroad, and seeking irrelevant information regarding "each of Defendants' Patents."

Subject to these objections and their General Objections, Plaintiffs respond that Mr. Austin Storms first learned of the '433 Patent on August 17, 2020 by reading a press release dated August 14, 2020 issued by Lancium regarding its lawsuit against Layer1 pending in the District Court for the Western District of Texas. Plaintiffs had not learned of any other of Defendants' patents prior to this lawsuit.

Interrogatory No. 7:

Identify when and in what manner Plaintiffs learned of Lancium LLC's PCT Patent Application, Publication No. WO2019139632A1.

ANSWER:

Plaintiffs object to Interrogatory No. 7 to the extent it calls for information protected by the attorney-client privilege or work-product doctrine. Plaintiffs object to Interrogatory No. 7 as overbroad, at least with respect to the phrases "in what manner." Subject to these objections and their General Objections, Plaintiffs respond that they learned of the '632 Application through Defendants' first Answer and Counterclaims, filed May 3, 2021.

Interrogatory No. 8:

Describe with particularity why Plaintiffs did not file suit against Defendants when Plaintiffs first learned of the '433 patent, including in your response the identity of any person or entity providing information related to that decision and the information provided.

ANSWER:

Plaintiffs object to Interrogatory No. 8 as vague and ambiguous, at least with respect to

the phrases “with particularity,” “any person or entity,” and “that decision.” Plaintiffs further object to Interrogatory No. 8 to the extent is seeks information protected by the attorney-client privilege and/or work product doctrine.

Subject to these objections and their General Objections, Plaintiffs respond that they did file suit after learning of the ’433 Patent, after a reasonable amount of time to analyze the patent, disclose information to Layer1 counsel regarding Plaintiffs inventorship rights, and upon learning by press release dated March 8, 2021 that the lawsuit filed by Lancium against Layer1 was settled, without correcting inventorship or otherwise resolving the rights of Mr. Austin Storms related to the ’433 patent. Mr. Austin Storms took a reasonable amount of time after the March 8, 2021 press release to explore Plaintiffs’ rights, retain counsel, and prepare and file this lawsuit on April 14, 2021, about five weeks later.

Interrogatory No. 9:

Describe with particularity the relationship between Plaintiffs and Great American Mining.

ANSWER:

Plaintiffs object to Interrogatory No. 9 as vague and ambiguous, at least with respect to the phrases “with particularity,” and “the relationship.” Plaintiffs further object to Interrogatory No. 8 to the extent is seeks information protected by the attorney-client privilege and/or work product doctrine.

Subject to these objections and their General Objections, Plaintiffs respond that Austin Storms was not employed by or otherwise involved with Great American Mining prior to or during his conception or reduction to practice of the BearBox Technology including the subject matter claimed in the ’433 patent, and Great American Mining has no ownership rights to the technology developed by Plaintiffs at issue in this lawsuit.

SUPPLEMENTAL ANSWER:

Mr. Storms was not affiliated in any way with Great American Mining when he conceived of and/or first reduced to practice the BearBox Technology including the subject matter claimed in the '433 patent. Nor was Mr. Storms affiliated in any way with Great American Mining at the time of Mr. Storms' disclosures to Lancium by way of Mr. McNamara in May 2019. Mr. Storms became a contract employee for Great American Mining in December 2019, and later became a full-time employee of Great American Mining in October 2020.

ASHBY & GEDDES

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Dated: November 9, 2021

EXHIBIT E

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

BEARBOX LLC and AUSTIN STORMS, Plaintiffs, v. LANCIUM LLC, MICHAEL T. MCNAMARA, and RAYMOND E. CLINE, JR. Defendants.	C.A. No. 21-534-MN

PLAINTIFFS' OBJECTIONS AND RESPONSES TO
DEFENDANTS' SECOND SET OF INTERROGATORIES (NOS. 10-21)

Pursuant to Rules 33 and 26 of the Federal Rules of Civil Procedure, Plaintiffs Bearbox LLC and Austin Storms (collectively, "Plaintiffs") hereby submits its Responses and Objections to the second set of interrogatories (Nos. 10-21) from Defendants, as follows:

PRELIMINARY STATEMENT

Plaintiffs' answers to Defendants' Second Set of Interrogatories are made to the best of Plaintiffs' present knowledge, information and belief. Plaintiffs expressly reserve its right to supplement and amend these answers, in accordance with applicable rules, to incorporate further information and documents and to offer such further information and documents at any trial or hearing in this case.

Plaintiffs make the objections and answers set forth below without waiving: (1) the right to object to the use of any answer, document or thing for any purpose in this action or any other actions on grounds of privilege, relevancy, materiality, or any other appropriate basis; (2) the right to object to any other discovery request involving or relating to the subject matter of the responses herein and any documents or things produced by Plaintiffs; (3) the right to revise,

correct, supplement, or clarify any of the responses provided below at any time; and (4) the right to seek a protective order with respect to discovery directed to damages.

GENERAL OBJECTIONS

1. Plaintiffs object to each interrogatory, and to each definition and instruction, to the extent that it calls for the disclosure of information that is protected by the attorney-client privilege, the work-product doctrine, Fed. R. Civ. P. 26(b)(3), or any other applicable law, rule, privilege, or immunity.

2. Plaintiffs object to each interrogatory, and to each definition and instruction, to the extent that it calls for the disclosure of information referring or relating to methods and/or products, especially future methods and products, that are not the subject matter of any claim or defense in this case on the ground that such information is not relevant, would not reasonably lead to the discovery of admissible evidence, and would unduly risk competitive injury to Defendant.

3. Plaintiffs object to each interrogatory, and to each definition and instruction, to the extent that it imposes obligations beyond or inconsistent with the requirements of the Federal Rules of Civil Procedure, the Local Rules of this Court, orders entered by the Court in this case, or any other applicable orders entered by the Court.

4. Plaintiffs object to each interrogatory, and to each definition and instruction, to the extent that it seeks to combine in a single interrogatory what otherwise should be asked in separate interrogatories. Plaintiffs object to the extent that these compound interrogatories exceed or will contribute to the exceeding of the numeric limits established in this Court's Scheduling Order. Plaintiffs deem the service of these interrogatories to constitute an admission by Defendant that they will not object to the number and/or numbering of interrogatories of a similar compound nature, if served by Plaintiffs.

5. These responses are made solely for the purpose of this action. Each response is subject to all objections as to competence, relevance, materiality, propriety, inadmissibility, and any and all other objections and grounds that would require the exclusion of any statement herein if the questions were asked, or any statements contained herein were made by a witness present and testifying in court, all of which objections and grounds are reserved and may be interposed at the time of trial.

6. The fact that Plaintiffs have answered any interrogatory herein should not be taken as an admission that Plaintiffs accept or admit the existence of any facts set forth or assumed by such interrogatory, or that such response constitutes admissible evidence. The fact that Plaintiffs have answered part of, or all of, any question is not intended and shall not be construed to be a waiver by Defendant of all or any part of any objection to any interrogatory herein.

7. Plaintiffs object to the definition of “Bearbox,” “Austin Storms,” “Plaintiffs,” “You” or “Your” to the extent the definition of any of these terms would require Plaintiffs to search for and produce any document or information that is not within their possession, custody, or control.

8. Plaintiffs object to the definition of “Alleged BearBox Technology.” Defendants attempts to limit the technology at issue in this to paragraph 2 of Plaintiffs’ First Amended Complaint, that is inappropriate, overly vague, mischaracterizes the record, and frustrates the discovery process. Plaintiffs’ statements in paragraph 2 of the First Amended Complaint are qualified as “general” summary statements related to the BearBox Technology meant to be informative as part of the pleading process. In addition, many other paragraphs of the First Amended Complaint further describe the BearBox Technology, including paragraph 4, which

states that "[t]he claimed subject matter of the '433 Patent falls fully within the scope of the BearBox Technology." Defendants' additional attempts to define Alleged BearBox Technology as technology identified in email communications with various third parties similarly mistaken and frustrating to the discovery process. For purposes of responding to these interrogatories, Plaintiffs will treat the term BearBox Technology to at least refer to any technology that is claimed in the '433 Patent, and when appropriate will refer to the technology in dispute in this litigation as Plaintiffs' technology.

9. Plaintiffs object to each interrogatory to the extent it seeks information subject to a confidentiality obligation due to a third party and/or disclosure of such information would be subject to governmental or other regulation.

10. Plaintiffs object to each interrogatory to the extent the interrogatory calls for interpretation of terms that have not yet been construed.

11. Plaintiffs object to each interrogatory to the extent that it requires disclosure of confidential, trade secret, or other proprietary information prior to entry of a suitable protective order.

12. These General Objections are incorporated into each specific response below as if they were fully repeated therein. Neither the inclusion of any Specific Objection in response to an interrogatory nor the failure to include any General Objection or Specific Objection in response to an interrogatory shall in any way be deemed as a waiver of any General Objection made herein or that may be asserted at another date. Defendant's response to any interrogatory is not, and shall not be construed as, an admission of the relevance or admissibility into evidence of such response or of the propriety of any of Plaintiff's interrogatories.

INTERROGATORY NO. 10:

Identify the individuals "Tom," "Todd," and "Ben" referenced in BB000000030, and the individual identified as "Lee S." in BB000000033.

Plaintiffs object to Interrogatory No. 10 as vague and ambiguous, at least with respect to the phrase "identify," and "Lee S." Plaintiffs further object that this Interrogatory calls for information that is not relevant to any claim or defense and is not proportional to the needs of the case. Plaintiffs object to Interrogatory No. 10 as overbroad and unduly burdensome because the burden outweighs the discovery's likely benefit. Plaintiffs object to Interrogatory No. 10 to the extent it seeks information that is protected by the attorney-client privilege or the work-product doctrine, including any information subject to the common-interest doctrine. Plaintiffs object to Interrogatory No. 10 to the extent it seeks information that is not in the Plaintiffs' possession, custody, or control.

Subject to these objections and their General Objections, Plaintiffs respond that "Tom" refers to Tom Maseiro, "Todd" refers to Todd Garland, and "Ben" refers to "Ben Hakes." Plaintiffs further respond that BB00000033 does not reference "Lee S.," but rather refers to "LaaS," which is an abbreviation for "Load as a Service."

INTERROGATORY NO. 11:

For each verbal communication referenced in Your Supplemental Answer to Defendants' Interrogatory No. 1, identify the date, circumstances (e.g., location and purpose), individuals present (if any), type of verbal communication (e.g., in-person, telephone, etc.)), and the specific subject matter allegedly verbally conveyed to Michael McNamara.

Plaintiffs object to Interrogatory No. 11 as overbroad, to the extent it asks for information regarding technology developed by the Plaintiffs that is not subject matter claimed in the '433

Patent or related subject matter that is relevant and proportional to the needs of the case. Plaintiffs further object to Interrogatory No. 11 as vague and ambiguous, at least with respect to the phrases "each verbal communication," "specific subject matter," and "circumstances (e.g., location and purpose)." Plaintiffs also object to Interrogatory No. 11 as overbroad and unduly burdensome, at least with respect to the phrases "circumstances (e.g., location and purpose)," "individuals present (if any)," and "type of verbal communication (e.g., in-person, telephone, etc.)," and to the extent that it calls for information relatively accessible to Defendants. Plaintiffs further object to Interrogatory No. 11 as overbroad and unduly burdensome because the burden outweighs the discovery's likely benefit. Plaintiffs object to Interrogatory No. 11 to the extent it seeks information that is protected by the attorney-client privilege or the work-product doctrine, including any information subject to the common-interest doctrine. Plaintiffs object to Interrogatory No. 11 to the extent it seeks information that is not in the Plaintiffs' possession, custody, or control. Plaintiffs object to Interrogatory No. 11 as unreasonably cumulative and duplicative, at least with Defendants' Interrogatory No. 1. See, e.g., Fed. R. Civ. P. 26(b)(2)(C)(i).

Subject to these objections and their General Objections, Plaintiffs respond that on May 3, 2019, at a cocktail mixer held at Fidelity's headquarters in Boston, Massachusetts, in conjunction with the Fidelity FCAT Summit, Mr. Austin Storms had various conversations with individuals present, including James McAvity, Jesse Peltan, Rich Godwin, Quinn Lawlor, Michael McNamara, and another Lancium representative purported to be Lancium's Chief Financial Officer.

Later on May 3, 2019, at the Envoy Hotel's restaurant in Boston, Massachusetts, The Outlook, Mr. Storms met for dinner with a group of individuals including at least the above-

mentioned individuals from the cocktail mixer, as well as at least Chris Bendikksen, possibly among other individuals. Mr. Storms sat at the far end of a long table with Mr. McNamara and the other Lancium representative, and explained to them, orally, Plaintiffs' ideas and technologies, including those that Plaintiffs had conceived and reduced to practice and those Plaintiffs had thus far only conceived, over the course of what was approximately a 2-hour dinner. The substance of Mr. Storms' disclosures is reflected in Plaintiffs' response to Interrogatory No. 1.

INTERROGATORY NO. 12:

For each element, and each combination thereof, of each claim of the '433 Patent for which You contend Austin Storms should be named as an inventor of the '433 Patent (i.e., made an original contribution, and communicated the same to Defendants), identify (on an element-by-element and combination-by-combination basis) all corroborating evidence on which you intend to rely to support each such contention.

Plaintiffs object to Interrogatory No. 12 for its incorrect characterization that "[Plaintiffs contend] Austin Storms should be named as an inventor of the '433 Patent (i.e., made an original contribution, and communicated the same to Defendants)." Austin Storms is the sole inventor of the '433 patent. In the alternative, he is at least a joint inventor with McNamara and Cline. Plaintiffs also object to Interrogatory No. 12 as vague and ambiguous, at least with respect to the phrase "for each element, and each combination thereof." Plaintiffs further object to Interrogatory No. 12 as overbroad, unduly burdensome, vague, and ambiguous, at least with respect to the phrase "identify (on an element-by-element and combination-by-combination basis) . . ." Plaintiffs also object to Interrogatory No. 12 for its incorrect characterization of Plaintiffs positions, at least with respect to the phrase "each such contention." Plaintiffs further object that this Interrogatory calls for information that is not relevant to any claim or defense and is not proportional to the needs of the case. Plaintiffs object to Interrogatory No. 12 as overbroad

and unduly burdensome because the burden outweighs the discovery's likely benefit. Plaintiffs object to Interrogatory No. 12 to the extent it seeks information that is protected by the attorney-client privilege or the work-product doctrine, including any information subject to the common-interest doctrine. Plaintiffs object to Interrogatory No. 12 to the extent it seeks information that is not in the Plaintiffs' possession, custody, or control. Plaintiffs object to Interrogatory No. 12 as unreasonably cumulative and duplicative, at least with Defendants' Interrogatory Nos. 1, 2, and 3. See, e.g., Fed. R. Civ. P. 26(b)(2)(C)(i).

Subject to these objections and their General Objections, Plaintiffs' incorporate by reference their responses to Interrogatory Nos. 1, 2, and 3.

INTERROGATORY NO. 13:

Identify all aspects of Your relationship and/or communications with Ben Hakes, including, but not limited to, the circumstances that led You to allegedly share aspects of the Alleged BearBox Technology with Mr. Hakes under conditions of confidentiality, the date(s) of such communications, the purpose of such communications, any agreements between You and Mr. Hakes, any money or other consideration provided to Mr. Hakes or his employers (e.g., Pareto Advisors, Conservis, River Financial) by You or vice versa.

Plaintiffs object to Interrogatory No. 13 as overbroad and unduly burdensome, because it calls for irrelevant subject matter, and the burden outweighs the discovery's likely benefit. Plaintiffs further object to Interrogatory No. 13 as vague, ambiguous, overbroad, and unduly burdensome, at least with respect to the phrases "all aspects," and "the circumstances that led [Plaintiffs]." Plaintiffs object to Interrogatory No. 13 to the extent it seeks information that is protected by the attorney-client privilege or the work-product doctrine, including any information subject to the common-interest doctrine. Plaintiffs object to Interrogatory No. 13 to the extent it seeks information that is not in the Plaintiffs' possession, custody, or control.

Subject to these objections and their General Objections, Plaintiffs respond that Ben Hakes contacted Mr. Austin Storms to facilitate an introduction to a wind farm operator. Mr. Storms and Mr. Hakes had various text message and email exchanges about the possible creation of a new company for which BearBox would be the operating entity for the wind farm. This transaction never occurred. The only written agreement between Plaintiffs and Mr. Hakes is a confidentiality agreement. Plaintiffs never paid any money to Mr. Hakes or his employer(s), nor does Mr. Hakes or his employers have any rights in Plaintiffs' inventions at issue in this litigation.

INTERROGATORY NO. 14:

If You contend that, on or before October 19, 2019, the Alleged BearBox Technology caused (and/or was configured to cause) a set of computing systems to meet a minimum power threshold associated for each time interval in a set of time intervals specified in received power option data, describe in detail how the Alleged BearBox Technology caused (or was configured to cause) such functionality, including the date such functionality existed, and identifying all documents in Your possession, custody, or control describing such functionality, including source (and/or computer) code. For the purpose of this Interrogatory, You should interpret the terms/phrases "a set of computing systems," "minimum power threshold," "set of time intervals," and "received power option data" as You interpreted those terms/phrases in answering Defendants' Interrogatory No. 3.

Plaintiffs object to Interrogatory No. 14 to the extent it calls for information protected by attorney-client privilege or work-product doctrine. Plaintiffs also object to Interrogatory No. 14 for its use of the phrase "if [Plaintiffs] contend that," at least because any answer that Plaintiffs may make to Interrogatory No. 14 will in no way endorse any characterization by Defendants of any position held by Plaintiffs. Plaintiffs further object to Interrogatory No. 14 as vague and ambiguous, at least with respect to the phrase "describe in detail." Plaintiffs further object that this Interrogatory calls for information that is not relevant to any claim or defense and is not proportional to the needs of the case. Plaintiffs object to Interrogatory No. 14 as overbroad and

unduly burdensome because the burden outweighs the discovery's likely benefit. Plaintiffs object to Interrogatory No. 14 to the extent it seeks information that is protected by the attorney-client privilege or the work-product doctrine, including any information subject to the common-interest doctrine. Plaintiffs object to Interrogatory No. 14 to the extent it seeks information that is not in the Plaintiffs' possession, custody, or control. Plaintiffs object to Interrogatory No. 14 as unreasonably cumulative and duplicative, at least with Defendants' Interrogatory Nos. 1, 2, and 3. See, e.g., Fed. R. Civ. P. 26(b)(2)(C)(i).

Subject to these objections and their General Objections, Plaintiffs incorporate by reference their responses to Interrogatory Nos. 1, 2, and 3.

INTERROGATORY NO. 15:

Identify all entities and/or persons who hold an interest in BearBox and describe the nature of each such interest with particularity.

Plaintiffs object to Interrogatory No. 15 as overbroad and unduly burdensome, because it calls for irrelevant subject matter, and the burden outweighs the discovery's likely benefit. Plaintiffs also object to Interrogatory No. 15 as vague and ambiguous, at least with respect to the phrase "particularity." Plaintiffs object to Interrogatory No. 15 to the extent it seeks information that is protected by the attorney-client privilege or the work-product doctrine, including any information subject to the common-interest doctrine. Plaintiffs object to Interrogatory No. 15 to the extent it seeks information that is not in the Plaintiffs' possession, custody, or control.

Subject to these objections and their General Objections, Plaintiffs respond that Mr. Austin Storms is, and at all times has been, the only person or entity with an interest in BearBox.

INTERROGATORY NO. 16:

Identify and describe in detail the relationship(s) that Austin Storms and/or BearBox have (or had) with all partners, agents, affiliates, shareholders, owners, entities, or persons relating to

the development, conception, reduction to practice, offers for sale, sales, and/or licensing of BearBox cryptocurrency mining or the Alleged BearBox Technology, including, but not limited to the "partner" referred to in BB00000100.

Plaintiffs object to Interrogatory No. 16 as overbroad and unduly burdensome, as it calls for information that is irrelevant and not proportional to the needs of the case. Plaintiffs also object to Interrogatory No. 16 to the extent it calls for information protected by attorney-client privilege or work-product doctrine. Plaintiffs further object to Interrogatory No. 16 as vague and ambiguous, at least with respect to the phrases "in detail," "relationship(s)," "partners, agents, affiliates, shareholders, owners, entities, or persons," and "relating to." Plaintiffs further object to Interrogatory No. 16 as overbroad, to the extent it asks for information regarding technology developed by the Plaintiffs that is not subject matter claimed in the '433 Patent or related subject matter that is relevant and proportional to the needs of the case, at least with respect to the phrase "BearBox cryptocurrency mining." Plaintiffs object to Interrogatory No. 16 as overbroad and unduly burdensome because the burden outweighs the discovery's likely benefit. Plaintiffs object to Interrogatory No. 16 to the extent it seeks information that is protected by the attorney-client privilege or the work-product doctrine, including any information subject to the common-interest doctrine. Plaintiffs object to Interrogatory No. 16 to the extent it seeks information that is not in the Plaintiffs' possession, custody, or control.

Subject to these objections and their General Objections, Plaintiffs respond that the "partner" referred to in BB00000100 was a partner from another entity, Stormsmedia LLC, an entity that, at the time of that email, was in the process of liquidating inventory and miners. For context, BearBox may have considered purchasing miners from Stormsmedia LLC to potentially supply a project for GlidePath. The miners owned by Stormsmedia, however, had already been sold at the time of that email, unbeknownst to Mr. Storms. The Stormsmedia LLC partner

described in the other email had no interest in BearBox or its assets at that time, or anytime thereafter, nor did that Stormsmedia LLC partner contribute to the conception, development, reduction to practice, or any other attribute of the Plaintiffs' technology at issue in this litigation.

INTERROGATORY NO. 17:

Identify each entity (or individual) who has purchased and/or otherwise received any aspect of the Alleged Bear Box Technology, the date such entity purchased or otherwise received the technology, the price (or other consideration) paid for the technology, the circumstances surrounding such purchase or other receipt of the technology, and what the entity or individual did with the Alleged BearBox Technology once it was purchased or otherwise received (e.g., the use to which the technology was put, the location(s) of such use, the date(s) of such use, etc.).

Plaintiffs object to Interrogatory No. 17 because it calls for information that is irrelevant and not proportional to the needs of the case. Plaintiffs further object to Interrogatory No. 17 as overbroad and unduly burdensome because the burden outweighs the discovery's likely benefit. Plaintiffs further object to Interrogatory No. 17 to the extent it calls for information protected by attorney-client privilege or work-product doctrine. Plaintiffs also object to Interrogatory No. 17 as vague and ambiguous, at least with respect to the phrases "otherwise received," "any aspect," and "circumstances surrounding." Plaintiffs further object to Interrogatory No. 17 as overbroad and unduly burdensome, and because it calls for information that is irrelevant and not proportional to the needs of the case, at least with respect to the phrase "what the entity or individual did." Plaintiffs object to Interrogatory No. 17 to the extent it seeks information that is protected by the attorney-client privilege or the work-product doctrine, including any information subject to the common-interest doctrine. Plaintiffs object to Interrogatory No. 17 to the extent it seeks information that is not in the Plaintiffs' possession, custody, or control.

Subject to these objections and their General Objections, Plaintiffs respond that none of Plaintiffs' technology at issue in this litigation was sold or otherwise transferred to any other

person or entity. The mining container and exhaust fans used by Plaintiffs to conceive of and develop the technology at issue in this litigation were sold to Great American Mining in late 2020. Great American Mining completely overhauled the electrical distribution system of the mining container to accommodate a new generation of miners. None of the source code, or other aspects of Plaintiffs' technology at issue in this litigation was ever sold or transferred to Great American Mining. Great American Mining eventually deployed that specific mining at an oil and gas production facility in North Dakota in an off-grid generation setup.

INTERROGATORY NO. 18:

Identify all analysis of the '433 Patent (e.g., infringement, noninfringement, validity, invalidity, freedom to operate, market, and/or other analysis) performed by You or on Your behalf.

Plaintiffs object to Interrogatory No. 18 because it calls for production of information protected by the attorney-client privilege, the work-product doctrine, or other applicable privileges and doctrines. Plaintiffs further object to Interrogatory No. 18 as overbroad and unduly burdensome, because it calls for information that is not proportional to the needs of the case, and because the burden outweighs the discovery's likely benefit. Plaintiffs further object to Interrogatory No. 18 as vague and ambiguous, at least with respect to the phrase "all analysis." Plaintiffs further object that this Interrogatory calls for information that is not relevant to any claim or defense and is not proportional to the needs of the case. Plaintiffs further object to Interrogatory No. 18 to the extent it seeks information that is not in the Plaintiffs' possession, custody, or control.

INTERROGATORY NO. 19:

Provide Your understanding in detail of the meaning of the term "CLR" (i.e., Controllable Load Resource) as You used the term in Your Supplemental Answer to Interrogatory No. 2.

Plaintiffs object to Interrogatory No. 19 as vague and ambiguous, at least with respect to the phrase "in detail." Plaintiffs further object that this Interrogatory calls for information that is not relevant to any claim or defense and is not proportional to the needs of the case. Plaintiffs object to Interrogatory No. 19 as overbroad and unduly burdensome because the burden outweighs the discovery's likely benefit. Plaintiffs object to Interrogatory No. 19 to the extent it seeks information that is protected by the attorney-client privilege or the work-product doctrine, including any information subject to the common-interest doctrine. Plaintiffs object to Interrogatory No. 19 to the extent it seeks information that is not in the Plaintiffs' possession, custody, or control.

Subject to these objections and their General Objections, Plaintiffs respond that their understanding is that a controllable load resource ("CLR"), as that term was used in Plaintiffs' supplemental response to Interrogatory No. 2, is a load that is capable of increasing or decreasing its electricity consumption over a set of time intervals, and in response to a variety of factors or constraints, and is consistent with how Defendants used the term CLR in documents in Case No. 6:20-cv-00739, for example in the Complaint, LANCIUM00016546, and Exhibit H, LANCIUM00016631.

INTERROGATORY NO. 20:

To the extent that You contend that prior to October 28, 2019 You had Documents evidencing that the Alleged BearBox Technology was capable of providing "fine-grain load control or true LaaS (referred to as CLR or LaaR within ERCOT)" as You use that phrase in Your Supplemental Answer to Defendants' Interrogatory No. 2, identify by Bates number each such Document and identify the portion(s) of each such Document that supports Your contention.

Plaintiffs object to Interrogatory No. 20 for its use of the phrases "to the extent that you contend," and "Your contention," at least because any answer that Plaintiffs may make to Interrogatory No. 20 will in no way endorse any characterization by Defendants of any position held by Plaintiffs. Plaintiffs further object to Interrogatory No. 20 as vague and ambiguous, at least with respect to the phrases "capable of providing," and "portion(s) of each such Document." Plaintiffs further object that this Interrogatory calls for information that is not relevant to any claim or defense and is not proportional to the needs of the case. Plaintiffs object to Interrogatory No. 20 as overbroad and unduly burdensome because the burden outweighs the discovery's likely benefit. Plaintiffs object to Interrogatory No. 20 to the extent it seeks information that is protected by the attorney-client privilege or the work-product doctrine, including any information subject to the common-interest doctrine. Plaintiffs object to Interrogatory No. 20 to the extent it seeks information that is not in the Plaintiffs' possession, custody, or control. Plaintiffs object to Interrogatory No. 20 as unreasonably cumulative and duplicative, at least with Defendants' Interrogatory Nos. 1, 2, and 3. See, e.g., Fed. R. Civ. P. 26(b)(2)(C)(i).

Subject to these objections and their General Objections, Plaintiffs incorporate by reference their responses to Interrogatory Nos. 1, 2, and 3.

INTERROGATORY NO. 21:

Provide Your understanding in detail of the meaning of the term/phrase "power option agreement" as You used that term/phrase in Your Supplemental Answer to Defendants' Interrogatory No. 1.

Plaintiffs object to Interrogatory No. 21 as vague and ambiguous, at least with respect to the phrase "in detail." Plaintiffs further object that this Interrogatory calls for information that is not relevant to any claim or defense and is not proportional to the needs of the case. Plaintiffs

object to Interrogatory No. 21 as overbroad and unduly burdensome because the burden outweighs the discovery's likely benefit. Plaintiffs object to Interrogatory No. 21 to the extent it seeks information that is protected by the attorney-client privilege or the work-product doctrine, including any information subject to the common-interest doctrine. Plaintiffs object to Interrogatory No. 21 to the extent it seeks information that is not in the Plaintiffs' possession, custody, or control.

Subject to these objections and their General Objections, Plaintiffs respond that their understanding is that a power option agreement, as that term was used in Plaintiffs' supplemental response to Interrogatory No. 2, is consistent with the use of that term as claimed and described in the '433 Patent, and includes an agreement between an entity associated with the delivery of power to a load and the load, and is consistent with how the Defendants used the term "power option agreement" in documents in Case No. 6:20-cv-00739, for example in the Complaint, LANCIUM00016546, and Exhibit H, LANCIUM00016631

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Dated: November 22, 2021

UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
WACO DIVISION

LANCIUM LLC, Plaintiff, v. LAYER1 TECHNOLOGIES, INC., Defendant.	Civil Action No. 6:20-cv-00739 **Jury Trial Demanded**

COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff Lancium LLC ("Lancium"), by and through its attorneys, brings this action and makes the following allegations of patent infringement relating to United States Patent No. 10,608,433 ("the '433 patent"). Defendant Layer1 Technologies, Inc. ("Layer1") infringes the '433 patent in violation of the patent laws of the United States of America, 35 U.S.C. § 1 *et seq*.

THE PARTIES

1. Plaintiff Lancium LLC is a Limited Liability Company, with its principal office and place of business at 6006 Thomas Road, Houston, Texas, 77041.

2. Upon information and belief, Defendant Layer1 is a Delaware Corporation whose principal office and place of business is at 221 Kearny Street, San Francisco, CA, 94108. Layer1 also has a place of business in Ward County, Texas, which is approximately 100-150 miles west of Midland, Texas, where Layer1 conducts Bitcoin mining operations.

JURISDICTION AND VENUE

3. This is an action for patent infringement arising under the patent laws of the United States of America, Title 35, United States Code.

4. This Court has subject matter jurisdiction over this action pursuant to 28 U.S.C. §§ 1331, 1338(a).

5. This Court has personal jurisdiction over the Defendant Layer1 because Layer1 has committed acts of patent infringement in this District. Upon information and belief, Layer1, utilizes Lancium's patented systems and methods to adjust power consumption based on power option agreements in connection with Layer1's Bitcoin mining operations in this District. Layer1, therefore, has systematic and continuous contacts with this District, regularly transacts business within this District, and regularly and purposefully avails itself of the benefits of this District. This Court further has personal jurisdiction over Layer1 generally because Layer1 maintains a principal place of business in this District (*e.g.*, Layer1's Bitcoin mining facilities are located in this District) and Layer1 regularly conducts business in this District. Layer1, therefore, has established minimum contacts within this District such that the exercise of jurisdiction over Layer1 would not offend traditional notions of fair play and substantial justice.

6. Venue is proper in this District pursuant to 28 U.S.C. §1400(b) because Layer1 has committed acts of patent infringement complained of herein in this District, and has a regular and established place of business in this District.

BACKGROUND

7. Michael McNamara and Raymond Cline, the founders of Lancium, created the company to capitalize on the growth of both renewable energy and distributed computing. The founders understood that the rise of renewable energy would result in greater variability of

electricity production and also electricity price. The growth of more renewable energy would also lead to increased periods and locations of negative-priced energy.

8. Messrs. McNamara and Cline further realized that this increased variability created an opportunity. In 2017, Lancium began work on an entirely new type of data center that could essentially be "turned off" during economically opportune time periods. This new type of data center could operate during periods of negatively-priced or low-priced power and not operate (*i.e.*, not draw load), or operate in a reduced capacity (*i.e.*, draw a limited amount of load), during times when power prices were higher.

9. These "flexible" data centers are useful for many computing workloads, including Bitcoin mining. Lancium developed and patented power management monitoring and control software ("Controllable Load Resource Technology") that permits data centers to ramp their power consumption up or down in seconds. This technology allows data centers to qualify as Controllable Load Resource(s) ("CLR") in the Electric Reliability Council of Texas ("ERCOT"). Upon information and belief, Lancium was the first load-only CLR.

10. A load-only CLR can be thought of as interacting with the grid in an inverse fashion to the way that a power generation station interacts with the grid. For example, when the demand for electricity is low (resulting in a low price for electricity), a power generation station would typically decrease its production of power. But in such a situation, a load-only CLR would increase power consumption by, for example, engaging in computationally intensive activities requiring significant amounts of electricity such as Bitcoin mining. Likewise, during times of high-priced electricity (*e.g.*, periods of high electricity demand), a power generation station would typically increase its production of power. A load-only CLR, however, would ramp down (*i.e.*, stop (or reduce) its electricity consumption) by, for example, ceasing (or

reducing) Bitcoin mining operations. When this occurs, the load-only CLR (*i.e.*, flexible data center) receives the difference in the value of the real time electricity versus the data center's pre-existing power purchase agreement price. Lancium's Controllable Load Resource Technology allows, among other things, flexible data centers to operate as load-only CLRs and to participate directly in the energy and ancillary services market.

11. Lancium's Controllable Load Resource Technology also benefits the general public and renewable energy generators. For example, when the load-only CLR ramps down, the electricity that the load-only CLR would have used is available for use by other loads such as consumers (*e.g.*, home owners, businesses, etc.). And when electricity prices are low (*e.g.*, in times of low demand), Lancium's technology permits the flexible data center's computer systems to ramp up to, for example, mine Bitcoins, thereby providing a market for excess electricity generated by renewable energy generators (*e.g.*, wind and solar powered energy generators) helping to mitigate variability and periods and locations with negatively priced energy.

12. Lancium's Controllable Load Resource Technology attracted the interest of many companies, including, upon information and belief, Layer1 as alleged below.

THE PATENT-IN-SUIT

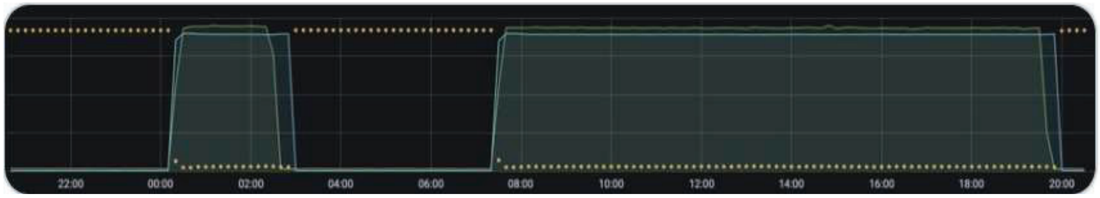
13. Lancium protected its revolutionary technology by, among other things, obtaining patents. On October 28, 2019, Lancium filed a provisional application no. 62/927,119 and, shortly thereafter, utility application no. 16/702,931, which duly and legally issued on March 31, 2020 as U.S. Patent No. 10,608,433 ("the '433 patent") titled "Methods and Systems for Adjusting Power Consumption Based on a Fixed-Duration Power Option Agreement." A true and correct copy of the '433 patent is attached as Ex. A.

14. The '433 patent is assigned to Lancium, which owns all right, title, and interest in and to the '433 patent, including the right to assert all caused of action arising under the '433 patent and the rights to remedies for infringement of the '433 patent.

LAYER1'S INFRINGEMENT

15. Layer1 owns and operates Bitcoin mining data centers in, upon information and belief, Ward County, Texas. Ex. B; Ex. C. Layer1 describes these Bitcoin mining facilities as "game changer[s] in Bitcoin mining." Ex. B, at 1. "Mining Bitcoin is about converting electricity into money," says Layer1's CEO, Alex Liegl. Ex. D, at 2. West Texas power is "the cheapest power in the world, at scale." Ex. E, at 2. Layer1's average production cost per bitcoin is $1,000.00, equating to a 90% profit margin at the bitcoin price of $9,100.00. Ex. D, at 2.

16. Layer1's Bitcoin mining facilities not only mine bitcoins. Layer1, upon information and belief, recently qualified as a load-only CLR. Ex. F. Upon information and belief, by entering into "demand response" contracts and utilizing what Layer1 characterizes as "its proprietary demand-response software," these data centers can be tapped in real time to meet peak market demand by shutting down mining operations at a minute's notice and instead allowing their load to flow onto the grid. Ex. D, at 2. "In summertime when air conditioners in Dallas, Houston, and Austin are going full tilt, Texas electricity prices sometimes surge to nosebleed levels Layer1 will be able to make more money by shutting off its mining machines and allowing the power to flow through its substation to the grid," says Alex Liegl. Ex. E, at 3. "This is what being a virtual power plant looks like . . . [s]oftware command instantly decreases or increases many megawatts of electricity and #bitcoin hashrate to stabilize public power grids." Ex. G.



Layer1's control system, including its "demand-response" software, upon information and belief, infringes Lancium's '433 patent as alleged below and in the attached exemplary claim chart (Exhibit H).

COUNT I – INFRINGEMENT OF U.S. PATENT NO. 10,608,433

17. Lancium incorporates by reference and re-alleges all of the preceding paragraphs of this Complaint as if fully set forth herein.

18. Layer1 infringes at least claims 1-3, 6-9, and 11-20 of the '433 patent literally or under the doctrine of equivalents in violation of 35 U.S.C. § 271(a) by manufacturing, using, offering to sell, selling, and/or importing infringing systems and methods for adjusting power consumption utilized in or by at least Layer1's Bitcoin mining facilities ("Infringing Products"). Exhibit H, attached hereto, is an exemplary claim chart showing how the systems and methods of the Infringing Products meet every limitation of, and therefore infringe, each of the above-identified claims.[1]

19. Lancium has suffered and continues to suffer damages as a result of Layer1's infringement in an amount to be determined at trial, which, by law, cannot be less than a reasonable royalty, but may also include lost profits, together with interest and costs as fixed by this Court under 35 U.S.C. § 284.

[1] To the extent the claim chart relies on exhibits not identified and attached to this Complaint, the exhibits are identified in and attached to the claim chart.

20. In addition, Layer1's past and ongoing infringement has caused, and continues to cause, Lancium substantial and irreparable harm for which there is no adequate remedy at law unless and until Layer1 is enjoined by this Court.

21. Layer1's infringement is willful. On May 22, 2020, Lancium notified Layer1 that Layer1's "data center demand response functionality . . . may infringe one or more Lancium's patents." Ex. I. A copy of the '433 patent was attached to the May 22, 2020 email. *Id.* After receiving no response from Layer1, Lancium reached out again on June 2, 2020. Ex. I. Layer1 did not respond, and has not responded to date.

22. Layer1, therefore, has had actual knowledge of the '433 patent since at least May 22, 2020.

23. Upon information and belief, Layer1 continued using Lancium's patented technology to operate its Bitcoin mining facilities in at least West Texas after May 22, 2020 (and continues those operations today). Therefore, at least as of May 22, 2020, and thereafter, Layer1's infringement was willful.

24. Lancium is entitled to a finding of willfulness and enhanced damages under at least 35 U.S.C. § 284 based upon Layer1's willful infringement of the '433 patent.

PRAYER FOR RELIEF

WHEREFORE, Lancium respectfully requests that this Court find in its favor and against Layer1, and that the Court grant Lancium the following relief:

A. Judgment in favor of Lancium that Layer1 has infringed, either literally and/or under the doctrine of equivalents, one or more claims of the '433 patent;

B. An award of all damages adequate to compensate Lancium for Layer1's infringement of the '433 patent;

C. Judgment that Layer1's infringement was willful and that the Court award treble damages for the period of such willful infringement pursuant to at least 35 U.S.C. § 284;

D. An award of pre-judgment and post-judgment interest at the maximum rate permitted by law;

E. A finding that this is an exceptional case and awarding Lancium its costs, expenses, disbursements, and reasonable attorney's fees related to Layer1's infringement under 35 U.S.C. § 285 and all other applicable statutes, rules, and common law;

F. A permanent injunction preventing Layer1, its officers, agents, servants and employees, and those person in active concert and participation with any of them, from infringement of one or more claims of the '433 patent or, in the alternative, if the Court finds that an injunction is not warranted, Lancium requests an award of post-judgment royalty to compensate for future infringement;

G. That Lancium be granted all other relief, in law or equity, as the Court may deem just and proper.

JURY TRIAL

Pursuant to Rule 38 of the Federal Rules of Civil Procedure, Lancium hereby requests a trial by jury on all issues so triable.

Case 6:20-cv-00739-ADA Document 1 Filed 08/14/20 Page 9 of 9

Dated: August 14, 2020

Respectfully submitted,

BARNES & THORNBURG LLP

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EXHIBIT H

Layer1 Claim Chart
U.S. Patent No. 10,608,433

Exemplary Asserted Claims	Layer1's Infringement
Claim 1	
A system comprising:	Layer1 has the claimed system: For example, "Layer 1 designs, produces, and operates its entire [Bitcoin] mining infrastructure, from proprietary ASIC chips and liquid-cooled mining container to wholly-owned power development and procurement." (*Ex. T*, *Layer1 2/19/2020*). "Layer1 builds turnkey, full-integrated Bitcoin mining data centers that boost profitability of energy assets and improve the reliability of electrical grids." *(Ex. J, Layer1.com 6/9/2020)*
[a1] a set of computing systems,	Layer1's system comprises a "set of computing systems": "Bitcoin miners are essentially the bookkeepers of the Bitcoin network, compiling transactions and adding them to 'blocks' of records published every 10 minutes. Miners earn the right to publish a block of transactions by being the first to solve a very hard, random mathematical equation known as a 'hash' or 'hashing puzzle.'" "When they win that computing race, miners are rewarded with a fixed amount of Bitcoin—currently 12.5 Bitcoin, or about $125,000." "[M]ost mining these days is at industrial scale." (*Ex. T*, *2/19/2020 Fortune*) Layer1 operates "two bitcoin factories – 20-by-8 shipping containers chock full of bitcoin miners … the mining machines are immersed in vats of liquid … that keeps them cool." (*Ex. E*, *2/28/2020* Forbes). These mining machines are a set of computing systems.
[a2] wherein the set of computing systems is configured to perform computational operations using power from a power grid;	Layer1's set of computing systems is configured to perform computational operations using power from the grid. "Bitcoin miners are essentially the bookkeepers of the Bitcoin network, compiling transactions and adding them to 'blocks' of records published every 10 minutes. Miners earn the right to publish a block of transactions

Layer1 Claim Chart
U.S. Patent No. 10,608,433

Exemplary Asserted Claims	Layer1's Infringement
	by being the first to solve a very hard, random mathematical equation known as a 'hash' or 'hashing puzzle.'" "When they win that computing race, miners are rewarded with a fixed amount of Bitcoin—currently 12.5 Bitcoin, or about $125,000." "[M]ost mining these days is at industrial scale." (*Ex. T*, *2/19/2020 Fortune*). Bitcoin mining involves performing computational operations as described above. Layer1's set of computing systems are configured to utilize power from a power grid. For example, Layer1's Bitcoin mining data centers have been "steadily mining Bitcoin at [its] large-scale power infrastructure property in West Texas" since early 2020. By centralizing the consumption and release of hundreds of Megawatts of electricity per site, each of our Bitcoin mining datacenters becomes a large-scale battery." (*Ex. J*, *Layer1.com, 6/9/2020*). Layer1 obtained the capital it needed to "acquire an entire electric substation capable of handling 100 megawatts, and 30 acres of land on which they aim to install a village consisting of dozens of their container-based bitcoin factories, each of which draws 2.5 mw (enough to power more than 1,000 homes)." (*Ex. E*, *Forbes, 2/28/2020*) Layer1's CEO (Alexander Liegl) admitted Layer1's computing systems perform computational operations using power from a power grid, stating: "… either you can get that electricity by collocating directly with energy plants or you can, as we're currently doing, buying it off the grid through our substation and then effectively you feed your electricity to your chips which do monotonous computation ..." Leslie Lamb, EP 9: YOUR LAYER1 "LIEGL" COUNSEL, ANCHOR FM (2020), https://anchor.fm/cryptounstacked/episodes/EP-9-Your-Layer1-Liegl-Counsel-eeuq3f (at 14:47 min) (last visited Aug 13, 2020). "Layer1's model also involves coordinating with the utilities supplying the electricity in a way that the startup says can stabilize power grids. The company pays for the electricity it needs." *(Ex. K, Business Insider 8/11/20)*

Layer1 Claim Chart
U.S. Patent No. 10,608,433

Exemplary Asserted Claims	Layer1's Infringement
[b] a control system configured to:	Layer1's "system" includes a "control system." "Layer1 is the first company in the global Bitcoin mining industry that can curtail large amounts of energy consumption during times of market need and release it to the grid at the push of a button." (*Ex. L*, 5/22/2020 Layer1). "Layer1 has entered into so-called "demand response" contracts whereby at a minute's notice they will shut down all their machines and instead allow their 100 mw load to flow onto the grid." (*Ex. D*, *Forbes, 5/21/*2020). "Through an instant software command, at the press of a button, [Layer1] can turn off dozens/hundreds of megawatts instantly. Ryan Selkis, LAYER 1 CEO ALEX LIEGL ON THE INSTITUTIONALIZATION OF MINING IN AMERICA, MESSARI.IO (2020), https://messari.io/article/layer-1-ceo-alex-liegl-on-the-institutionalization-of-mining-in-america (at 14:05 min) (last visited Aug 13, 2020). Layer1 has "the capability to participate in demand response management just because of the unique software platform that we've built." Christine Kim, CRYPTO LONG AND SHORT: A NEW MARKET PART 3 WITH ALEXANDER LIEGL, FRANK HOLMES, ETHAN VERA COINDESK.COM (2020), https://www.coindesk.com/videos/coindesk-tv-consensus-distributed/crypto-long-and-short-a-new-market-part-three-with-alexander-liegl-frank-holmes-ethan-vera (at 4:35 min) (last visited Aug 13, 2020). Layer1's proprietary "demand-response" software can be activated to stabilize the energy grid by dynamically managing its [Layer1's] electricity usage during periods of peak market demand. (*Ex. L*, 5/22/2020 Layer1). The ability to shut down its Bitcoin mining machines "at a minute's notice" and "dynamically manage" its energy usage demonstrates that Layer1 utilizes a control system.
[b1] monitor a set of conditions;	Layer1's control system is configured to "monitor a set of conditions":

Layer1 Claim Chart
U.S. Patent No. 10,608,433

Exemplary Asserted Claims	Layer1's Infringement
	"Layer1 has entered into so-called "demand response" contracts whereby at a minute's notice they will shut down all their machines and instead allow their 100 mw load to flow onto the grid." (*Ex. D*, *Forbes, 5/21/*2020). Layer1's proprietary "demand-response" software can be activated to stabilize the energy grid by dynamically managing its [Layer1's] electricity usage during periods of peak market demand. (*Ex. L*, 5/22/2020 Layer1). Layer1 maintains that it "is the first company in the global Bitcoin mining industry that can curtail large amounts of energy consumption during times of market need and release it to the grid at the push of a button, …." (*Ex. L*, *PRNewswire, 5/22/2020*) Layer1's stated ability to "dynamically manage" its electricity usage during periods of peak market demand and release its energy load to the grid at the push of a button indicates the ability to monitor a set of conditions, such as the market demand for electricity, frequency of the grid, price of electricity, etc. Monitoring certain conditions such as hash rate, price, and power is part of Layer1's arbitrage software functionality. "There's a power arbitrage opportunity as well. In the summertime when air conditioners in Dallas, Houston and Austin are going full tilt, Texas electricity prices sometimes surge to nosebleed levels. When that happens, Layer1 will be able to make more money by shutting off its mining machines and allowing the power to flow through its substation to the grid. "'We can stabilize the grid by selling capacity for curtailment at the push of a button," says Liegl.'" (*Ex. E*, *Forbes, 2/28/2020*). "Bitcoin Mining Arbitrage Stack: 1) Fixed Price Power Contract; 2) Grid Congestion Hedge; 3) Forward Sell CLR Capacity; 4) Bitcoin Futures; 5) Hashrate Futures." (*Ex. M*, 8/3/2020 tweet). Layer1 monitors at least hash rate and price in conjunction with their arbitrage activities. *See, e.g.*, Christine Kim, CRYPTO LONG AND SHORT: A NEW MARKET PART 3 WITH ALEXANDER LIEGL, FRANK

Layer1 Claim Chart
U.S. Patent No. 10,608,433

Exemplary Asserted Claims	Layer1's Infringement
	HOLMES, ETHAN VERA COINDESK.COM (2020), https://www.coindesk.com/videos/coindesk-tv-consensus-distributed/crypto-long-and-short-a-new-market-part-three-with-alexander-liegl-frank-holmes-ethan-vera (at 2:00 min) (last visited Aug 13, 2020). "And since it's a refinery business you benefit from output multiplicity. Power, hashrate, bitcoin. Multi-variate capital allocation problem to create something scalable across those vectors." (*Ex. N*, 8/7/2020 tweet).
[b2(i)] receive power option data based, at least in part, on a power option agreement	Layer1's control system is configured to "receive power option data based, at least in part, on a power option agreement." Upon information and belief, the control system receives power option data from at least the Electric Reliability Council of Texas ("ERCOT"), which operates the electric grid and manages the deregulated market for 75 percent of the state. Alex Liegl stated: "… some entity like ERCOT can call on us and in the course of 5 minutes … through an instant software command at the press of a button we can turn off you know dozens/hundreds of megawatts instantly. So effectively, it's a big energy arbitrage play …" Ryan Selkis, LAYER 1 CEO ALEX LIEGL ON THE INSTITUTIONALIZATION OF MINING IN AMERICA, MESSARI.IO (2020), https://messari.io/article/layer-1-ceo-alex-liegl-on-the-institutionalization-of-mining-in-america (at 13:59 min) (last visited Aug 13, 2020). Upon information and belief, "Layer1 has entered into so-called "demand response" contracts whereby at a minute's notice they will shut down all their machines and instead allow their 100 mw load to flow onto the grid." (*Ex.* D, *Forbes, 5/21/2020*). Layer1's proprietary "demand-response" technology is "based on the energy market standards developed by the

LANCIUM00016636

Layer1 Claim Chart
U.S. Patent No. 10,608,433

<table>
<tr><th>Exemplary Asserted Claims</th><th>Layer1's Infringement</th></tr>
<tr><td></td><td>
Electric Reliability Council of Texas (ERCOT)." (Ex. L, PRNewswire, 5/22/2020).
Layer1's CEO (Alex Liegl) notes that "[p]hysical power plants take days to turn on/off power and can only in-/decrease output in inefficient bulky increments (>1MW) … [v]irtual power plants instantly turn on/off power and can in-/decrease output in efficient hyper-granular increments (1kW) = 1000x improvement" (Ex. O, 5/27/2020 tweet). "Software command instantly decreases or increases many megawatts of electricity and #bitcoin hashrate to stabilize power grids:"


(Ex. G, 6/7/2020 tweet). "L1 virtual power plant data centers [i.e., Bitcoin mining facilities] shut down during peaks for a discounted overall $MWh power price." (Ex. P, 6/8/2020 tweet).
Upon information and belief, Layer1's "demand-response" contracts are power option agreements (POA) and Layer1's system receives power option data (e.g., minimum power threshold(s) associated with one or more time intervals for the load to operate at in accordance with/based on the POA, other constraints that its data centers should operate in accordance with, indications of a monetary penalty that would be imposed on the data centers for failure to operate as agreed upon in the POA, indications of a monetary benefit provided to the load operating at power consumption levels in accordance with the POA, one or more maximum power thresholds and corresponding time intervals for those thresholds, and/or the frequency at which the grid is operating) based, at least in part, on the power option agreement(s).
</td></tr>
</table>

Layer1 Claim Chart
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Exemplary Asserted Claims	Layer1's Infringement
	Layer1 has "the capability to participate in demand response management just because of the unique software platform that we've built." Christine Kim, CRYPTO LONG AND SHORT: A NEW MARKET PART 3 WITH ALEXANDER LIEGL, FRANK HOLMES, ETHAN VERA COINDESK.COM (2020), https://www.coindesk.com/videos/coindesk-tv-consensus-distributed/crypto-long-and-short-a-new-market-part-three-with-alexander-liegl-frank-holmes-ethan-vera (at 4:35 min) (last visited Aug 13, 2020). Upon information and belief, a system operating as a Controllable Load Resource (CLR) receives power option data as part of a power option agreement. Layer1's system is operating as a Controllable Load Resource (CLR) within the ERCOT market. (*Ex. F*, 8/1/2020 tweet).
[b2(ii)] wherein the power option data specify: (i) a set of minimum power thresholds and (ii) a set of time intervals,	*See* [b2(i)] above. Layer1's system is operating as a Controllable Load Resource (CLR) within the ERCOT market, (*Ex. F*, 8/1/2020 tweet), which, upon information and belief, requires, among other things, that Layer1 receive a set of minimum power thresholds (typically in MWs) for Layer1 data centers (the Load) to operate) over a set of time intervals (e.g., CLR base points every 5 minutes) with intermediate thresholds provided at, for example, 5 second intervals (e.g., CLR updated base points) to define the path for Layer1's data centers to ramp to the scheduled minimum power threshold. Upon information and belief, Layer1 has demonstrated its system's ability to receive and respond to power option data that includes a varying set of minimum power thresholds (in MW) corresponding to a set of time intervals (in seconds) through its substation.

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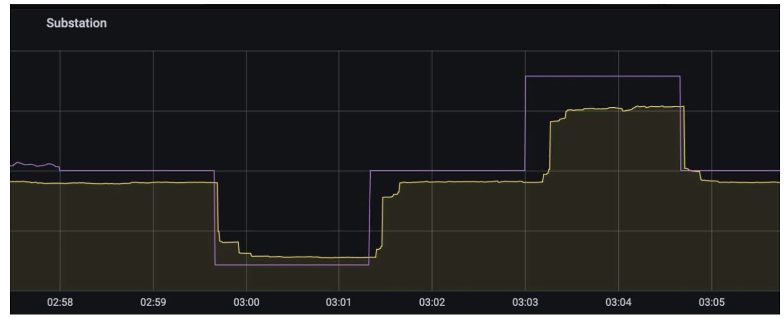
Exemplary Asserted Claims	Layer1's Infringement
	 (*Ex. Q*, 6/17/2020 tweet). Upon information and belief, Layer1 also employed or employs other types of Load Response programs which also meet this limitation.
[b2(iii)] wherein each minimum power threshold in the set of minimum power thresholds is associated with a time interval in the set of time intervals;	*See* above.
[c1] responsive to receiving the power option data, determine a performance strategy for the set of computing systems based on a combination of at least a portion of the power option data and at least one condition in the set of conditions,	Layer1's control system is configured to be "responsive to receiving the power option data, determine a performance strategy for the set of computing systems based on a combination of at least a portion of the power option data and at least one condition in the set of conditions" Layer1's system employs bitcoin miners as computing systems. *See* "a set of computing systems" above. Upon information and belief, Layer1's system determines a performance strategy for their computing systems, including, for example, specifying operating modes, power on/off, and/or standby states for groups of miners in order to provide a granular response to meet the power option data power thresholds.

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Exemplary Asserted Claims	Layer1's Infringement
	Upon information and belief, in order to determine such a performance strategy, Layer1's system must necessarily monitor current conditions including, for example, operating modes, power on/off, and/or standby states of the computing systems. Upon information and belief, Layer1's systems also consider other conditions such as hash rate, price, and power. *See* "monitor a set of conditions" above. Layer1 states that their "[v]irtual power plants instantly turn on/off and can in-/decrease output in efficient hyper-granular increments (1kW) . . . ." (*Ex. O*, *5/27/2020 Tweet*). More specifically, Layer1's "[b]itcoin mining provides granularity in demand-response that alternatives can not. Miners can be shut down in batches, providing the precise wattage the grid needs." (*Ex. R*, *Arvanaghi 6/10/2020 11:02AM Tweet*). Additionally, "Layer1 has entered into so-called "demand response" contracts whereby at a minute's notice they will shut down all their machines and instead allow their 100 mw load to flow onto the grid." (*Ex. D*, *Forbes, 5/21/*2020). Layer1's proprietary "demand-response" software can be activated to stabilize the energy grid by dynamically managing its [Layer1's] electricity usage during periods of peak market demand. (*Ex. L*, 5/22/2020 Layer1). "'If there is an insufficiency of supply we can shut down.' The best part, they get paid whether a grid emergency occurs or not. Just for their willingness to shut in Bitcoin production, Layer1 collects an annual premium equating to $19 per megawatthour of their expected power demand — or about $17 million." (*Ex. D*, *Forbes, 5/21/2020*). To accomplish the above functionality, Layer1, on information and belief, receives power option data (*e.g.*, one or more of at least the minimum power threshold(s) associated with one or more time intervals for the load to operate at in accordance with/based on the POA, other constraints that

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Exemplary Asserted Claims	Layer1's Infringement
	its data centers should operate in accordance with, indications of a monetary penalty that would be imposed on the data centers for failure to operate as agreed upon in the POA, indications of a monetary benefit provided to the load operating at power consumption levels in accordance with the POA, one or more maximum power thresholds and corresponding time intervals for those thresholds, and/or the frequency at which the grid is operating) and determines a performance strategy based on a portion of the power option data and one or more conditions (*e.g.*, current, future, and past prices for power, power availability, current and/or predicted weather conditions, data center workloads, types of computing systems available within datacenters, price to obtain power at the data center, levels of power storage available and accessible at each data center, power availability (*e.g.*, power consumption ranges at a set of computing systems and/or one or more datacenters, determining source(s) of power available at a data center (BTM, grid, battery), power prices, computing system parameters, cryptocurrency prices, computational operational parameters, and/or current/predicted weather conditions).
[c2] wherein the performance strategy comprises a power consumption target for the set of computing systems for each time interval in the set of time intervals	Upon information and belief, Layer1's "performance strategy comprises a power consumption target for the set of computing systems for each time interval in the set of time intervals" Upon information and belief, Layer1 has demonstrated its system's ability to develop a performance strategy that includes power consumption targets for each interval in a varying set of minimum power thresholds (in MW) corresponding to a set of time intervals (in seconds).

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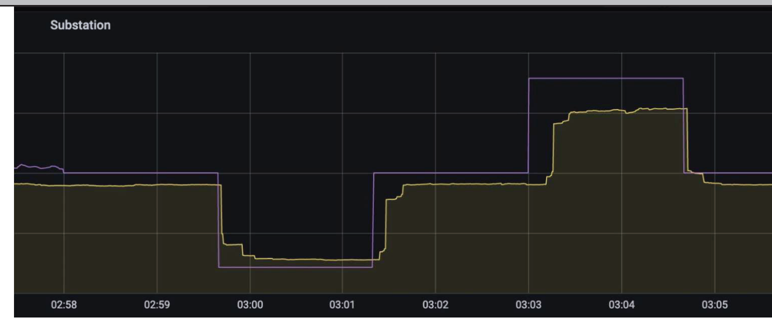
<table>
<tr><th>Exemplary Asserted Claims</th><th>Layer1's Infringement</th></tr>
<tr><td></td><td>


(*Ex. Q*, 6/17/2020 tweet). *See also* [b2(ii)] above.

Upon information and belief, Layer1 also employed or employs other types of Load Response programs which also meet this limitation. Layer1's demand-response software "instantly decreases or increases many megawatts of electricity and #bitcoin hashrate to stabilize public power grids:"

(*Ex. G*, *6/7/2020 Tweet*). Upon information and belief, the above graph illustrates the ability to control the power consumption to a target point over time intervals. *See also Ex. Q, 6/17/2020 Tweet*) (showing Layer1's controlled power levels in one second intervals).
</td></tr>
<tr><td>[c3] wherein each power consumption target is equal to or greater than the minimum power threshold associated with each time interval; and</td><td>Upon information and belief, as a Controllable Load Resource (CLR) within the ERCOT market, (Ex. F, 8/1/2020 tweet), Layer1's system controls Layer1's load such that the power consumption target for Layer1's computing load, for each associated time interval, equals the</td></tr>
</table>

Layer1 Claim Chart
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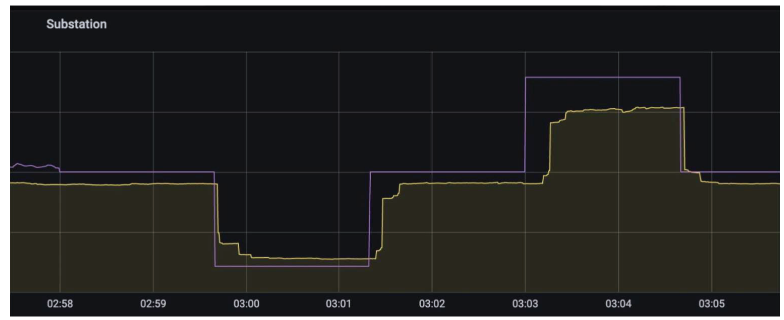
Exemplary Asserted Claims	Layer1's Infringement
	base point and base point updates thresholds set by ERCOT. *See* [b(2)(iii) – c(2) above]. Upon information and belief, Layer1 has demonstrated its system's ability to develop a performance strategy that includes power consumption targets for each interval in a varying set of minimum power thresholds (in MW) corresponding to a set of time intervals (in seconds).  (*Ex. Q*, 6/17/2020 tweet). Additionally, upon information and belief, due to control lag, Layer1's power consumption target may necessarily be greater than the minimum power threshold as the system ramps down to meet a base point threshold. *See, e.g.,* graph above around and immediately preceding time 3:00. Upon information and belief, Layer1 also employed or employs other types of Load Response programs which also meet this limitation. Layer1's demand-response software "instantly decreases or increases many megawatts of electricity and #bitcoin hashrate to stabilize public power grids:"

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Exemplary Asserted Claims	Layer1's Infringement
	 (*Ex. G*, *6/7/2020 Tweet*). Upon information and belief, the above graph illustrates the ability to control the power consumption to a target point over time intervals. *See also Ex. Q, 6/17/2020 Tweet*) (showing Layer1's controlled power levels in one second intervals prior to their announcement as a CLR on July 31, 2020).
[d] provide instructions to the set of computing systems to perform one or more computational operations based on the performance strategy.	Layer1's control system is configured to "provide instructions to the set of computing systems to perform one or more computational operations based on the performance strategy." Upon information and belief, Layer1's control system can, based on the performance strategy discussed above, provide instructions to the set of computing systems, for example, to turn on and/or to enter a higher power state, and therefore perform on or more computational operations. Layer1 states that their "[v]irtual power plants instantly turn on/off and can in-/decrease output in efficient hyper-granular increments (1kW) . . . ." (*Ex. O*, *5/27/2020 Tweet*). More specifically, Layer1's "[b]itcoin mining provides granularity in demand-response that alternatives cannot. Miners can be shut down in batches, providing the precise wattage the grid needs." (*Ex. R*, *Arvanaghi 6/10/2020 11:02AM Tweet*). Layer1 further states that it can "stabilize the grid by selling capacity for curtailment at the push of a button." (*Ex. E*, *Forbes 2/28/2020*). "Virtual power plants instantly turn on/off power and can in-/decrease output in efficient hyper-granular increments (1kW) = 1000x improvement." (*Ex. O*, 5/27/2020 *Tweet*). Layer1's "[s]oftware command' instantly decreases

Layer1 Claim Chart
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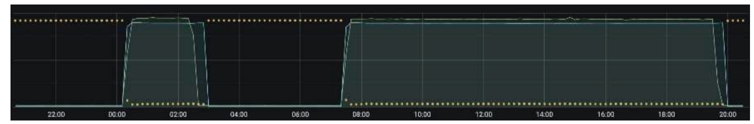
Exemplary Asserted Claims	Layer1's Infringement
	or increases many megawatts of electricity and #bitcoin hashrate to stabilize public power grids:"  (*Ex. G, 6/7/2020 Tweet*).
Claim 2	
The system of claim 1,	*See claim 1, preamble*
wherein the control system is configured to monitor the set of conditions comprising:	*See claim 1, elements [b] and [b1]*
[a] a price of power from the power grid; and	Upon information and brief, Layer1 monitors, for example, the price of power from the grid so as to determine whether to, at least, turn on/off power and/or increase/decrease output. (*Ex. O, 5/27/2020 Tweet*) *See also claim 1, element [b1]*.
[b] a plurality of parameters associated with one or more computational operations to be performed at the set of computing systems.	Layer1, upon information and belief, Layer1's control system is configured to monitor more than one parameter associated with the computational operations performed at its Bitcoin mining data centers, for example, monitoring conditions such as hash rate, price, and power is part of Layer1's arbitrage software functionality. *See claim 1, element [b1]*. Additionally, Layer1 virtual power plant data centers (*i.e.*, Bitcoin mining facilities) shut down during peaks for a discounted overall \$/MWh power price. (*Ex. P, 6/8/2020 Tweet*). As noted by Forbes, "[t]here's a power arbitrage opportunity as well. In the summertime when air conditioners in Dallas, Houston and Austin are going full tilt, Texas electricity prices sometimes surge to nosebleed levels. When that happens, Layer1 will be

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Exemplary Asserted Claims	Layer1's Infringement
	able to make more money by shutting off its mining machines and allowing the power to flow through its substation to the grid. 'We can stabilize the grid by selling capacity for curtailment at the push of a button,' says Liegl." (*Ex. E, 2/28/2020 Forbes*). Layer1 thus must be able to determine when it is more profitable to bitcoin mine and when it is more profitable to shut down. To make such a determination, Layer1, on information and belief, monitors, for example, the price of power, and parameters (e.g. cost) associated with its computational operations.
Claim 3	
The system of claim 2,	
wherein the control system is configured to:	
determine the performance strategy for the set of computing systems based on a combination of at least the portion option data, the price of power from the grid, and the plurality of parameters associated with one or more computational operations.	Layer1's system determines a performance strategy based, at least in part, on power option data. *See claim 1, element [c1]*. Upon information and belief, Layer1's system determines a performance strategy based, at least in part, on the price of power from the grid. *See claim 2, elements [a] and [b]*. Upon information and belief, Layer1's system determines a performance strategy based, at least in part, the plurality of parameters associated with one or more computational operations. Layer1 thus must be able to determine when it is more profitable to bitcoin mine and when it is more profitable to shut down. To make such a determination, Layer1, on information and belief, monitors, for example, the price of power, and parameters (e.g. cost) associated with its computational operations. *See claim 2, elements [a] and [b]*.
Claim 6	
The system of claim 1,	*See claim 1, preamble*
wherein the control system is further configured to:	*See claim 1*

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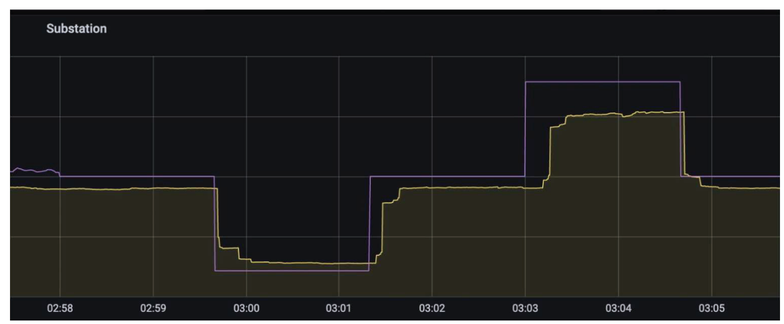
<table>
<tr><th>Exemplary Asserted Claims</th><th>Layer1’s Infringement</th></tr>
<tr><td>[a] receive subsequent power option data based, at least in part, on the power option agreement,</td><td>Layer1’s control system is further configured to receive subsequent power option data based, at least in part, on the power option agreement.

For example, upon information and belief, as a CLR (see claim 1, element [b(2)(i)]) Layer1’s system receives, as power option data, CLR base points every 5 minutes and, additionally, updated base points every 5 seconds to guide Layer1’s load ramping. See claim 1, element [b(2)(ii)]. Additionally, upon information and belief, such base point data may be interspersed with primary frequency response data as a condition of participating as a CLR.

Upon information and belief, Layer1’s control system is not limited to a one-time event. Upon information and belief, Layer1’s control system, therefore, is further configured to receive subsequent (e.g., later in time or in operation) power option data that is based in part on the demand-response contract(s) (POA(s)).</td></tr>
<tr><td>[b] wherein the subsequent power option data specify to decrease one or more minimum power thresholds of the set of minimum power thresholds.</td><td>Upon information and belief, base point data transmitted as part of CLR power option data can specify increased or decreased base points or updated base points. See, e.g., Layer1’s chart of power thresholds:



(Ex. Q, 6/17/2020 tweet).</td></tr>
</table>

Layer1 Claim Chart
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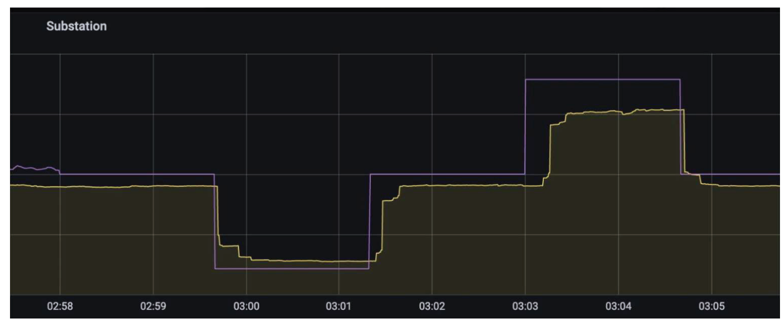
Exemplary Asserted Claims	Layer1's Infringement
	Accordingly, upon information and belief, subsequent power option data can specify a decrease in one or more minimum power thresholds.
Claim 7	
The system of claim 6,	*See claim 6, preamble*
wherein the control system is further configured to:	*See claim 6*
[a] responsive to receiving the subsequent power option data, modify the performance strategy for the set of computing systems based on a combination of at least the portion of the subsequent power option data and at least one condition in the set of conditions	*See claim 6, elements [a] and [b], claim 1, element [c1]*
[b] wherein the modified performance strategy comprises one or more reduced power consumption targets for the set of computing systems.	Upon information and belief, Layer1 has demonstrated its system's ability to develop a performance strategy that includes power consumption targets for each interval in a varying set of minimum power thresholds (in MW) corresponding to a set of time intervals (in seconds).  (*Ex. Q*, 6/17/2020 tweet). Upon information and belief, as Layer1's system receives subsequent power option data, *see claim 6, element [a]*, the system can set a reduced power consumption target for the set of computing system to meet the power threshold(s). *See claim 1, element [c3]*.

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Exemplary Asserted Claims	Layer1's Infringement
Claim 8	
The system of claim 7,	*See claim 7*
wherein the control system is further configured to:	*See claim 7*
provide instructions to the set of computing systems to perform the one or more computational operations based on the modified performance strategy.	*See claim 1[d]*.
Claim 9	
The system of claim 1,	*See claim 1, preamble*
wherein the control system is a remote master control system positioned remotely from the set of computing systems.	Layer1's system includes multiple 40' x 20' containers, with each container containing computing systems. Leslie Lamb, EP 9: YOUR LAYER1 "LIEGL" COUNSEL, ANCHOR FM (2020), https://anchor.fm/cryptounstacked/episodes/EP-9-Your-Layer1-Liegl-Counsel-eeuq3f (at 10:13 min) (last visited Aug 13, 2020). It is not uncommon to locate master control systems remotely from the computer systems being controlled.
Claim 11	
The system of claim 1,	*See claim 1, preamble*
wherein the control system is configured to receive the power option data while monitoring the set of conditions.	Upon information and belief, Layer1's control system must be configured to receive the power option data while monitoring the set of conditions. According to Alex Liegl, "[s]oftware command ***instantly*** decreases or increases many megawatts of electricity and #bitcoin hashrate to stabilize public power grids." (*Ex. G*, *6/7/2020 Tweet*). To achieve such control, there should be minimal (if any) delay between control system receiving the power option data and the control system monitoring the set of conditions.
Claim 12	
The system of claim 1,	*See claim 1, preamble*
wherein the control system is further configured to:	*See claim 1*

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Exemplary Asserted Claims	Layer1's Infringement
provide a request to a qualified scheduling entity (QSE) to determine the power option agreement;	Upon information and belief, Layer1's system engages in power arbitrage. *See claim 1, element [b(1)]*. Upon information and belief, to be able to engage in arbitrage, for example in ERCOT, Layer1's system must be able to submit a load bid through a QSE in order to receive (e.g., determine) a power option agreement as an operational CLR. Upon information and belief, Layer1 has demonstrated the ability to submit load bids through a QSE.  The above image tweeted by Alex Liegl, upon information and belief, is a QSE screen, and according to Alex Liegl, purports to show Layer1's system as an operational 1MW CLR. (*Ex. F*, 8/1/2020 tweet) Additionally, upon information and belief, a load resource can submits bids in ERCOT's day-ahead market and in response to SCED dispatches, which are other demand response programs. As a load resource, upon information and belief, Layer1 also employed or employs other types of

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Exemplary Asserted Claims	Layer1's Infringement
	Load Response programs which also meet this limitation. *See claim 1, elements [b(1], [b(2)(1)], and [c(3)].*
and receive power option data in response to providing the request to the QSE.	Upon information and belief, upon receiving (e.g., determining) a power option agreement, Layer1 receives power data. *See claim 1, element [b(2)(i)].*
Claim 13	
The system of claim 1, wherein the power option data specify:	*See claim 1, preamble*
[a] (i) a first minimum power threshold associated with a first time interval in the set of time intervals, and (ii) a second minimum power threshold associated with a second time interval in the set of time intervals	*See claim 1, elements [b2(i) and b2(ii)].* Layer1 states that "[v]irtual power plants instantly turn on/off and can in-/decrease output in efficient hyper-granular ***increments*** (1kW)…." (*Ex. O, 5/27/2020 Tweet*). The capability to increase or decrease in "increments" is evidence that Layer1's control system utilizes power thresholds associated with multiple time intervals.
[b] wherein the second time interval is subsequent to the first time interval.	A second timer interval is normally considered to occur subsequent to a first time interval.
Claim 14	
The system of claim 13, wherein the control system is configured to:	*See claim 13*
[a] determine the performance strategy for the set of computing systems such that the performance strategy comprises:	*See claim 1, element [c1]*
[b] a first power consumption target for the set of computing systems for the first time interval, wherein the first power consumption target is equal to or greater than the first minimum power threshold; and	*See claim 1, elements [c2 and c3] and claim 13*
[c] a second power consumption target for the set of computing systems for the second time interval, wherein the second power consumption target is equal to or greater than the second minimum power threshold.	*See claim 1, elements [c2 and c3] and claim 13*

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Exemplary Asserted Claims	Layer1's Infringement
Claim 15	
The system of claim 1,	*See claim 1, preamble*
wherein a total duration of the set of time intervals corresponds to a twenty-four hour period.	Upon information and belief, because one of the durations that ERCOT accepts for load bidding corresponds to a twenty-four hour period, at least some of Layer1's total duration of the set of time intervals correspond to a twenty-four hour period.
Claim 16	
The system of claim 1, wherein the set of conditions monitored by the control system further comprise:	*See claim 1, preamble and elements [b] and [b1]*
[a] a price of power from the power grid; and	*See claim 3.* Additionally, Layer1 states there is a power arbitrage opportunity. When electricity prices are high, Layer1 will be able to make more money by shutting off its mining machines and allowing the power to flow through its substation to the grid. (*Ex. E,* 2/28/2020 Forbes). To make this determination, Layer1, upon information and belief, monitors the price of power from the power grid.
[b] a global mining hash rate and a price for a cryptocurrency; and wherein the control system is configured to:	*See element [a], above.* Upon information and belief, Layer1 must also monitor the global mining hash rate and a price for cyptocurrency (*e.g.*, Bitcoin) to make the determination whether it will make more money from bitcoin mining or from selling capacity for curtailment. Because Layer1 contends it can make these determinations (*e.g.*, whether to mine or shout off its machines) in real time (or near real time), it also monitors these set of conditions.
[c] determine the performance strategy for the set of computing systems based on a combination of at the portion of the power option data, the price of power from the power grid, the global mining hash rate and the price for the cryptocurrency,	*See, e.g., element [b] above, claim 1, element [c1], claim 3.*
[d] wherein the performance strategy specifies for at least a subset of the set of computing systems to perform mining operations for the cryptocurrency when the price	Layer1 states that its software can "instantly decrease[] or increase[] many megawatts of electricity and #bitcoin hashrate to stabilize public power grids." (*Ex.* G, 6/7/2020 Tweet). Layer1's increasing the bitcoin hash rate,

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Exemplary Asserted Claims	Layer1's Infringement
of power from the power grid is equal to or less than a revenue obtained by performing the mining operations for the cryptocurrency.	on information and belief, evidences its ability to control a subset of the set of computing systems to perform mining operations. *See, also, claim 1, element [d]* (granular control of a subset of the set of computing systems.)
Claim 17	
A method comprising:	
[a] monitoring, by a computing system, a set of conditions;	*See claim 1, elements [a1] and [b1].*
[b1(i)] receiving, at the computing system, power option data based, at least in part, on a power option agreement	*See claim 1, element [b2(i)]*
[b1(ii)] wherein the power option data specify: (i) a set of minimum power thresholds, and (ii) a set of time intervals,	*See claim 1, element [b2(ii)]*
[b1(iii)] wherein each minimum power threshold in the set of minimum power thresholds is associated with a time interval in the set of time intervals;	*See claim 1, element [b2(iii)]*
[b2(i)] responsive to receiving the power option data, determining a performance strategy for a set of computing systems based on a combination of at least a portion of the power option data and at least one condition in the set of conditions,	*See claim 1, element [c1]*
[b2(ii)] wherein the performance strategy comprises a power consumption target for the set of computing systems for each time interval in the set of time intervals,	*See claim 1, element [c2]*
[b2(iii) wherein each power consumption target is equal to or greater than the minimum power threshold associated with each time interval; and	*See claim 1, element [c3]*

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Exemplary Asserted Claims	Layer1's Infringement
[c] providing instructions to the set of computing systems to perform one or more computational operations based on the performance strategy.	*See claim 1, element [d]*
Claim 18	
The method of claim 17,	
wherein determining the performance strategy for the set of computing systems comprises:	*See claim 17*
identifying information about the set of computing systems;	Layer1 identifies information about the set of computing systems. For example, Layer1 identifies, at least, the power consumption of the set of computing systems and the bitcoin hashrate of the set of computing systems. (*Ex. G*, 6/7/2020 Tweet).
and determining the performance strategy to further comprise instructions for at least a subset of the set of computing systems to operate at an increased frequency based on a combination of at least the portion of the power option data and the information about the set of computing systems.	Upon information and belief, Layer1's system uses bitcoin miners that can operate at multiple frequencies. For example, the common AntMiner S9 can operate at 550 MHz, 600 MHz, or 650 MHZ. (Ex. S, Antminer S9 Installation Guide, page 6). Upon information and belief, Layer1's system adjusts the operation of a subset of their computing systems to achieve granularity. Layer1 states that their "[v]irtual power plants instantly turn on/off and can in-/decrease output in efficient hyper-granular increments (1kW)…." (*Ex. O, 5/27/2020 Tweet*). Upon information and belief, Layer1 increases output, and therefore load, in hypergranular increments by operating miners at an increased frequency.
Claim 19	
The method of claim 17, further comprising	
[a1] receiving subsequent power option data based, at least in part, on the power option agreement,	*See claim 6, element [a]*
[a2] wherein the subsequent power option data specify to decrease one or more minimum power thresholds of the set of minimum power thresholds;	*See claim 6, element [b]*

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Exemplary Asserted Claims	Layer1's Infringement
[b1(i)] responsive to receiving the subsequent power option data, modifying the performance strategy for the set of computing systems based on a combination of at least the portion of the subsequent power option data and at least one condition in the set of conditions,	*See claim 7, element [a]*
[b1(ii)] wherein the modified performance strategy comprises one or more reduced power consumption targets for the set of computing systems; and	*See claim 7, element [b]*
[c] providing instructions to the set of computing systems to perform the one or more computational operations based on the modified performance strategy.	*See claim 8 and claim 1, element [d]*
Claim 20	
A non-transitory computer readable medium having stored therein instructions executable by one or more processors to cause a computing system to perform functions comprising:	Upon information and belief, Layer1's system utilizes a non-transitory computer readable medium having instructions executable by one or more processors to cause a computing system to perform multiple functions, including those set forth below.
[a] monitoring a set of conditions;	*See claim 1, elements [a1], [b], and [b1]*
[b1(i)] receiving power option data based, at least in part, on a power option agreement,	*See claim 1, element [b2(i)]*
[b1(ii) wherein the power option data specify: (i) a set of minimum power thresholds, and (ii) a set of time intervals,	*See claim 1, element [b2(ii)]*
[b1(iii)] wherein each minimum power threshold in the set of minimum power thresholds is associated with a time interval in the set of time intervals;	*See claim 1, element [b2(iii)]*
[c1] responsive to receiving the power option data, determining a performance strategy for a set of computing systems based on a combination of at least a portion of the power option data and at least one condition in the set of conditions,	*See claim 1, element [c1]*

Layer1 Claim Chart
U.S. Patent No. 10,608,433

Exemplary Asserted Claims	Layer1's Infringement
[c2] wherein the performance strategy comprises a power consumption target for the set of computing systems for each time interval in the set of time intervals,	*See claim 1, element [c2]*
[c3] wherein each power consumption target is equal to or greater than the minimum power threshold associated with each time interval; and	*See claim 1, element [c3]*
[d] providing instructions to the set of computing systems to perform one or more computational operations based on the performance strategy.	*See claim 1, element [d]*

EXHIBIT G

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

BEARBOX LLC AND AUSTIN STORMS, *Plaintiffs*, **v.** **LANCIUM LLC, MICHAEL T. MCNAMARA,** **AND RAYMOND E. CLINE, JR.,** *Defendants.*	§ § § § § § § § § §	**CIVIL ACTION 1:21-cv-00534-MN-CJB**

Expert Report of Dr. Stan McClellan

April 5, 2022

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of the filing of the '433 patent. I understand that the filing date of the '433 patent is December 4, 2019.

[46] In my opinion, at the time of the filing of the '433 patent, one of ordinary skill in the art should have a degree in electrical engineering, computer science, or a similar field and one to two years of experience in the field of software or an equivalent level of experience.

[47] My qualifications and experience exceed those of a person having ordinary skill in the art.

A.3. Claim Construction of Certain Terms in the '433 patent

[48] I understand that the determination of whether there is infringement involves a two-step analysis. The first step in an infringement analysis is to determine or construe the meaning of the terms of the asserted claims. The second step in an infringement analysis is to apply or compare each of the asserted claims, as construed, to the accused products or to the use of the accused products.

[49] I understand that claim terms by default are construed by their plain and ordinary meanings to a person of ordinary skill in the art. For purposes of my analysis, I have applied the plain and ordinary meaning of the claim terms. I reserve the right to supplement my report should Lancium use a different construction, if the Court provides a construction, or the like.

VI. OVERVIEW OF THE LANCIUM'S SMART RESPONSE SYSTEM

[50] I understand that Lancium uses and/or sells Bitcoin mining related and power arbitrage services under the product name Smart Response™. I understand that Lancium's Smart Response™ system acts as a "Controllable Load Resource" data center which alternately mines Bitcoin or sells energy to the grid based on conditions such as energy prices, Bitcoin pricing and hashtag rates, and the like, as explained in more detail below.

wherein the power option data specify: (i) a set of minimum power thresholds, and (ii) a set of time intervals, wherein each minimum power threshold in the set of minimum power thresholds is associated with a time interval in the set of time intervals.

[62] The systems conceived of and/or developed by Bearbox satisfy this aspect of claim 1 at least because the Bearbox systems calculated profitability at distinct time intervals, each with an associated power threshold, such as comparing mining profitability based on, inter alia, current power usage and energy price conditions on the one hand with profitability based, inter alia, on expected future power usage and energy price conditions. For example, the Bearbox system used multiple time intervals, including the day-ahead hourly intervals and real-time 5-minute intervals, each of which included an associated minimum power threshold used in periodically determining performance strategies (i.e. every five minutes). The Bearbox system also included custom PDU software capable of providing fine grain load control (i.e. the ability to turn on some but not all of the miners) and also was configured to work modularly with a variety of different miners that had different power requirements.[3]

[63] To the extent this feature is found not to be explicitly described in the Bearbox disclosure, it is my opinion that merely ordinary skill would have been required to modify the existing system to explicitly incorporate this feature. For example, the involvement of and communication with a QSE in connection with power option agreements (and the data associated with power option agreements) was well-known, conventional feature in the art at the time of the invention.[4]

[64] I list below certain exemplary modules and files that I considered pertinent to my analysis and opinions. The noted modules perform functions related to receiving power option data in which minimum power thresholds at various time intervals are used to determine a performance

[3] Ex. 5, Deposition of Austin Storms, dated February 23, 2022, pp. 99-100, 290.
[4] I discussed these issues and facts with Frank McCamant by telephone on April 1, 2022, and I understand that his report explains these concepts in additional detail. I reserve the right to supplement my report based on any additional information that may be included in his report.

2. cgminer_sqlite_test.py - Remotely communicates with miners to retrieve status information
3. DA_LMP_import.py - Imports marketplace data and returns the day-ahead marginal power price (LMP)
4. DA_LMP_import_AEC.py - Imports marketplace data and returns the day-ahead marginal power price (LMP)
5. email_alert.py - Provides email alerts for mining machine states (on, off, restart, shutdown, etc)
6. EXELON4.py - Computes "break even" point for mining Bitcoin in dollars per kilowatt-hour.
7. get_current_RT_LMP.py - Fetches marketplace data and returns the real-time local market price (LMP)
8. miner_amort_breakeven_.py - Performs profitability determinations for dynamic power thresholds and manages mining system based on resulting performance strategy.
9. LMP_csv_import.py - Retrieves the marginal power pricing data from Southwest Power Pool marketplace
10. test_profit.py - Simulates a mining operation's profitability
11. test_test_test.py - Simulates a mining operation's profitability.

Claim 1(e): "provide instructions to the set of computing systems to perform one or more computational operations based on the performance strategy"

[68] Bearbox conceived of and developed technology that includes a system comprising providing instructions to the set of computing systems to perform one or more computational operations based on the performance strategy.

[69] The systems conceived of and/or developed by Bearbox satisfy this aspect of claim 1 at least because the Bearbox system instructed miners in accordance with the determined performance strategy, such as enabling certain miners to mine Bitcoin. The Bearbox system also included custom PDU software capable of providing fine grain load control (i.e. the ability to turn

on some but not all of the miners) and also was configured to work modularly with a variety of different miners that had different power requirements. [6]

[70] I list below certain exemplary modules and files that I considered pertinent to my analysis and opinions. The noted modules perform functions related to providing instructions to the set of computing systems to perform one or more computational operations based on the performance strategy. Non-exhaustive examples are listed below with reference to the current claim language. A detailed analysis of each module is provided in the Appendix.

1. arb_main_AEC.py - Processes marginal power price data to determine profitability of Bitcoin mining based on several parameters, and controls power to mining systems based on outcomes.
2. cgminer_sqlite_test.py - Remotely communicates with miners to retrieve status information
3. DA_LMP_import.py - Imports marketplace data and returns the day-ahead marginal power price (LMP)
4. DA_LMP_import_AEC.py - Imports marketplace data and returns the day-ahead marginal power price (LMP)
5. email_alert.py - Provides email alerts for mining machine states (on, off, restart, shutdown, etc)
6. EXELON4.py - Computes “break even” point for mining Bitcoin in dollars per kilowatt-hour.
7. get_current_RT_LMP.py - Fetches marketplace data and returns the real-time local market price (LMP)
8. miner_amort_breakeven_.py - Performs profitability determinations for dynamic power thresholds and manages mining system based on resulting performance strategy.
9. LMP_csv_import.py - Retrieves the marginal power pricing data from Southwest Power Pool marketplace
10. test_profit.py - Simulates a mining operation’s profitability
11. test_test_test.py - Simulates a mining operation’s profitability.

[6] Ex. 5, Deposition of Austin Storms, pp. 99-100, 290.

to the grid (depicted with green dollar signs in the middle of the diagram). The diagram indicates that the system may periodically (such as every 5-minutes, hourly, or the like) re-evaluate the monitored conditions and implement a performance strategy based on those conditions.

[178] In addition, Bearbox also provided a comma-separated value (.CSV) file[25] that described various monitored conditions, including Bitcoin price, Bitcoin block height, real time LMP day ahead LMP, an estimated network hash rate and a network difficulty. This proprietary .CSV file also described and/or explained how to determine a generated mining revenue figure to be expect from using power to mine Bitcoin, a real time LMP revenue figure based on selling energy to the grid at the current real time energy price, a day ahead LMP revenue figure based on selling energy to the grid in the future at the day ahead energy price, and a realized revenue figure that represented the most profitable of the three other revenue figures. In some instances, the most profitable option was to mine Bitcoin (*see, e.g.,* row 2 and cells H2 and L2), while in other instances, the most profitable option was to sell energy to the grid (*see, e.g.,* row 7 and cells K7 and L7).

A.2. My Opinions Concerning Whether the Information Provided by Bearbox to Lancium Disclosed The Inventions Claimed in the '433 Patent

[179] In my opinion, the information provided by Bearbox to Lancium would have enabled a person of ordinary skill the art to make and use the invention recited in claims 1-20, either by its explicit description or because it was described in such detail that only ordinary skill was required to modify the information to arrive at the claimed inventions.

A.3. The Claims of the '433 Patent

[180] I understand claims 1, 17 and 20 are the only Asserted Claims written in independent form.

A.3.i. Claim 1

[181] Claim 1 is reproduced below:

[25] Ex. 4, BB00000097.

Dated: April 5, 2022

Dr. Stan McClellan

EXHIBIT H

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

BEARBOX LLC and AUSTIN STORMS,	)	
	)	
Plaintiffs,	)	
	)	
v.	)	C.A. No. 21-534-MN-CJB
	)	
LANCIUM LLC, MICHAEL T. MCNAMARA, and RAYMOND E. CLINE, JR.	)	
	)	
Defendants.	)	

EXPERT REPORT OF MARK EHSANI, Ph. D.

OUTSIDE COUNSEL'S EYES ONLY - SUBJECT TO PROTECTIVE ORDER

43. I note that Dr. McClellan did not perform any claim construction. Instead, he applied the "plain and ordinary meaning of the claim terms." (McClellan Report, at ¶ 49). But Dr. McClellan did not provide his understanding of the "plain and ordinary meaning" for any claim terms. I understand that Plaintiffs have the burden of proof on the inventorship issue.

44. To determine conception, I also apply the plain and ordinary meaning of the claim terms as would have been understood by a POSITA and, for certain terms, I discuss the specification's use of those terms. I reserve the right to supplement my report should Plaintiffs' or any of Plaintiffs' experts use a different construction, or provide their understanding of the plain and ordinary meaning that is different than my understanding of the plain and ordinary meaning.

VII. LANCIUM INDEPENDENTLY DEVELOPED, CONCEIVED, AND REDUCED ITS TECHNOLOGY TO PRACTICE, INCLUDING EACH OF THE INVENTIONS CLAIMED IN THE '433 PATENT

45. It is my opinion that Lancium independently developed, conceived, and reduced its technology to practice, including each of the inventions claimed in the '433 patent, and that such development, conception, and reduction to practice did not involve the use of any information allegedly provided to Mr. McNamara by Mr. Storms. As discussed above, my opinions are based on, among other things, my review of: (1) pleadings; (2) the '632 application and the '433 patent and its file history; (3) the parties' Responses to Discovery (including documents cited in those responses); (4) the deposition testimony from this case and exhibits cited in same; (5) my review of other documents and materials; (6) the communications between Mr. Storms and Mr. McNamara; and (7) my education and forty-plus years of experience. I also relied in part on Mr. Siddiqi's analysis as set forth in his report, and Mr. Baer's analysis of the source code produced by Mr. Storms and relied upon by Dr. McClellan as discussed in Mr. Baer's report.

for T&D costs and was contemplated to be implemented behind-the-meter.[286] For example, as discussed above, Mr. Storms' drawing appears to indicate, his container is connected behind-the-meter, as implied by the connection to "Generation Assets" and the picture of the windfarm. There is no indication of grid connection or grid power. A POSITA would understand this to mean that price of power from the power grid is not relevant to Mr. Storms's purported system. Additionally, the illustrated price clouds each recite "for pricing node." Node pricing is relevant to busses and generation. Loads are settled at zonal pricing and thus zonal, not nodal, is the relevant pricing structure for loads purchasing power from the grid.

355. I also note that Dr. McClellan does not address Mr. Storms' interactions with Mr. Hakes or Mr. Labij from GlidePath. As discussed above, based on my review of the documents, it appears that many of Mr. Storms' so-called power arbitrage ideas did not originate with Mr. Storms, but rather originated from Mr. Hakes and/or Mr. Labij.

XII. CONCLUSION

356. This report is based on information currently available to me. I reserve the right to supplement and/or modify this report, including without limitation in response to any new arguments/opinions advance by Plaintiffs' expert(s) in their Reply report(s) regarding any of the matters set forth herein. I anticipate in my testimony using some of the above-referenced documents and items, or other information and material that may be produced during the course of this litigation, including representative charts, graphs, timelines, diagrams or models, that will

[286] *See*, *e.g.*, Mr. Storms' drawing (BB00000092), which appears to indicate that the box is connected behind-the-meter, as implied by the connection to "Generation Assets" and the picture of the windfarm. There is no indication of grid connection or grid power. *See also* Baer Report, at ¶¶ 58-59, 64, Ex. F. A POSITA would thus understand that Mr. Storms' "system" was not contemplated to use power from a power grid.

be based on those documents, items, information and material to support, summarize and explain my testimony.

EXHIBIT I

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

BEARBOX LLC AND AUSTIN STORMS, *Plaintiffs*,	§	
v.	§	**CIVIL ACTION 1:21-cv-00534-MN-CJB**
LANCIUM LLC, MICHAEL T. MCNAMARA, **AND RAYMOND E. CLINE, JR.,** *Defendants.*	§	

Reply Expert Report of Dr. Stan McClellan

May 20, 2022

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II. MY COMMENTS ON THE EXPERT REPORT OF MARK EHSANI, PH.D.

[5] The following are my comments on the expert report of Mark Ehsani, Ph.D. dated May 6, 2022.

A.1. Level of Ordinary Skill in the Art

[6] I note that Dr. Ehsani uses a definition for the person of ordinary skill in the art (POSA) in his analysis that differs from mine. Ehsani, ¶¶39-40. My opinions, both those expressed in my Initial Report and those here, would not change if I used Dr. Ehsani's definition of a POSA.

[7] My qualifications and experience exceed those of a person having ordinary skill in the art, using either my definition or Dr. Ehsani's. Based on my qualifications and experience, I am able to opine on the knowledge of a person having ordinary skill in the art.

A.2. Claim Construction of Certain Terms in the '433 patent

[8] I understand that claim terms by default are construed by their plain and ordinary meanings to a person of ordinary skill in the art. For purposes of my analysis, I have applied the plain and ordinary meaning of the claim terms. I reserve the right to supplement my report should Lancium use a different construction, if the Court provides a construction, or the like. I understand that, throughout this case, Lancium has taken the position that claim construction is unnecessary.

A.3. Lancium's Alleged Conception of the Inventions Described in the '433 Patent

[9] In paragraphs 23-37, under the heading "Legal Principles," Dr. Ehsani describes various legal standards. He states in paragraph 21 that he does "not offer opinions on the relevant law in this report because I am not a lawyer." Similarly, I do not offer opinions on the relevant law because I am not a lawyer.

[10] My understanding of the legal standard for determining inventorship is an evaluation of conception, which is the touchstone of invention. Conception is considered the mental part of invention, such as whether the inventor had a definite idea, or particular solution to

the day-ahead hourly intervals and real-time 5-minute intervals, each of which included an associated minimum power threshold used in periodically determining performance strategies (i.e. every five minutes). The Bearbox system also included custom PDU software capable of providing fine grain load control (i.e. the ability to turn on some but not all of the miners) and also was configured to work modularly with a variety of different miners that had different power requirements.[1]

[26] In my opinion, the Lancium system did not consider multiple time intervals with associated power thresholds, as exemplified by the Lancium system described in the '632 Application (described above), until after its communications with Storms.

[27] In addition, I also explained that, to the extent this feature is found not to be explicitly described in the Bearbox disclosure, it is my opinion that merely ordinary skill would have been required to explicitly incorporate this feature. For example, the involvement of and communication with a QSE in connection with power option agreements (and the data associated with power option agreements) was well-known, conventional feature in the art at the time of the invention.[2] Dr. Ehsani appears to agree with me to the extent he states that McNamara and Cline were familiar with these well-known principles.

Claim 1(d): responsive to receiving the power option data, determine a performance strategy for the set of computing systems based on a combination of at least a portion of the power option data and at least one condition in the set of conditions, wherein the performance strategy comprises a power consumption target for the set of computing systems for each time interval in the set of time intervals, wherein each power consumption target is equal to or greater than the minimum power threshold associated with each time interval"

[1] Ex. 7, Deposition of Austin Storms, dated February 23, 2022, pp. 99-100, 290.
[2] I discussed these issues and facts with Frank McCamant by telephone on April 1, 2022, and I have now since reviewed his report and my opinions have not changed. I reserve the right to supplement my report based on any additional information that may be included in his supplemental report.

[261] In paragraph 141, Mr. Baer disagrees with my analysis to the extent it depends from claim 1. I disagree with his analysis of these claims for the reasons set forth above.

[262] In paragraph 142 and 143, Mr. Baer again conflates minute details of the simulation Storm built with the full breadth of the capabilities of which the system both described in the various documents and embodied in the simulation serve as proof of concept. I disagree, as at least in paragraphs 45 and 83 of his report, Mr. Baer acknowledges that the system was capable of operating with different types of miners having different power requirements and/or operational characteristics, as noted above.

IV. CONCLUSION

[263] I reserve the right to supplement this statement and/or to address any testimony or other evidence offered by Lancium, including in response to this statement.

I. APPENDIX – REVISED MODULE DESCRIPTION

[A.4] DA_LMP_import_AEC.py [BB_SC-026]

Same as A.3 but without [/18] logic that solves for date discrepancies in the CSV file name.

EXHIBIT J

UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

BEARBOX, LLC, and AUSTIN STORMS, Plaintiffs,	)	
-vs-	)	No. C.A. 21-534-MN-CJB
LANCIUM, LLC, MICHAEL T. McNAMARA, and RAYMOND E. CLINE, JR., Defendants.	)	

Deposition of STANLEY A. MCCLELLAN, Ph.D. taken before CAROL CONNOLLY, CSR, CRR, and Notary Public, pursuant to the Federal Rules of Civil Procedure for the United States District Courts pertaining to the taking of depositions, at 233 South Wacker Drive, Suite 6300, Chicago, Illinois, commencing at 9:08 a.m. on the 3rd day of June, A.D., 2022.

THE WITNESS: It's the time period around this case which, in my opinion, is relatively compact.
MR. NELSON: Q So the time period from when to when then? Give me years.
A I think the patent was filed in 2019, right? The date of the patent filing -- If you look at the timeline there's the date when they started -- when Storms started to develop stuff, and there's a date when Lancium had product, and there's a date where they overlapped, then there's a date when the patent was filed. All of that timeframe was fairly compact between like 2018 and 2020. It's about a two-year period -- two- or three-year period in there.
Q So is that the time period you used, or did you use your understanding as you were doing your -- plain and ordinary meaning as you were doing your analysis -- When you were writing your report, what time period did you use?
MR. RICORDATI: Objection. Asked and answered.
THE WITNESS: The time period of the report is early 2022 which abuts the time period of the activity of the patent and stuff. So it's basically all the same time period. I don't know that there's any substantial migration or substantial changes in any of the terms that

are associated with this patent or with this case. If there have been -- if there have been, then we need to isolate those and make sure that there wasn't any misinterpretation of anything.
MR. NELSON: Q What's your understanding of the plain and ordinary meaning of power option agreement?
A My understanding of power option agreement is it's essentially a contract to buy power at a certain price. It's like a wholesale purchase. I'm going to buy X number of units at X price.
Q What's your understanding of power option data?
A Power option data is the data that's associated with the power option agreement.
Q What -- is there any specific data that's required to be power option data, or can it be anything?
A I think at least it has intervals and minimum thresholds. There may be other data that's associated with that, but I think there's thresholds over intervals.
Q And intervals are intervals of time?
A Time intervals, yeah.
Q And what are thresholds?
A You agree to buy power at that -- you agree to consume that much power at a certain price at that time.
Q You agree to buy that much power or consume

that much power?
A Typically it's consume because you're a load that's not controllable. If you're a controllable load, then you're buying that power with the assumption that you're going to consume it. If you have ability to sell it back, then you can sell it back. But you don't sell it back to whoever you bought it from, you sell it into a market at that time. It's an agreement with the seller to consume, right?
And consume doesn't mean use. Consume means purchase. Whether I use that power to do something with or whether I sell that power to somebody else, that's separate from the power option agreement.
Q What's your understanding of a minimum power threshold in this case as used in the '433 patent?
A That's the data that's associated with the option agreement.
Q What specifically is a minimum power threshold?
A That's the amount of power that you're contracted to consume.
Q And by consume you don't mean use, correct?
A I may not use it, but I'm going to consume it. I'm purchasing it. Whether I use it or whether I sell it, that's a completely separate issue. I'm agreeing to

purchase it at that threshold.
Q So just to be clear so our -- Your use of the word consume here means -- it doesn't mean physically the data center consumes the power by using it. It also could mean that the power is sold back.
A Consume is a transactional thing. Right. The consumption is a transaction where I'm consuming it. I have to dispatch that power some way.
Q What do you understand the term performance strategy to mean in the context of the claims of the '433 patent?
A A performance strategy is deciding -- is a decision based on incoming data and conditions and monitored conditions as to how to dispatch the -- how to dispatch the power that's been consumed through the PPA against bitcoin miners or not.
Q So in your understanding of performance strategy could performance strategy be to not consume power?
A It could be --
Q I'm sorry. Let me -- I asked a bad question because I used the word consume in a different context.
So in your understanding of the term performance -- the meaning of the term performance

EXHIBIT K

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

BEARBOX LLC AND AUSTIN STORMS, *Plaintiffs*,	§ § §	
v.	§ §	**C.A. No. 21-534-GBW-CJB**
LANCIUM LLC, MICHAEL T. MCNAMARA,	§ §	
AND RAYMOND E. CLINE, JR., *Defendants.*	§ § §	

Supplement to Expert Reports of Dr. Stan McClellan

November 11, 2022

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I. INTRODUCTION

[1] I previously submitted expert reports, dated April 5, 2022 ("Original Report") and May 20, 2022 ("Reply Report"), for the above referenced matter. Those opinions have not changed. This Supplement provides clarification regarding conception of certain intellectual property by Mr. Storms, the communication of his ideas to Defendants ("Lancium") in light of the Court's Markman Order dated October 28, 2022 ("Markman Order"). I reserved the right to provide this Supplement should the Court construe any terms after I provided my Reports.

[2] As noted in my Original Report and Reply Report, it is my understanding that Bearbox seeks to correct inventorship of U.S. Patent No. 10,608,433 (hereinafter referred to as "the '433 patent"). My Original Report provides an analysis showing (1) Plaintiffs' conception and possession of the technologies recited in the claims of the '433 patent and/or other power arbitrage methods prior to their meetings with Lancium; (2) Plaintiffs provided an enabling description of this information to Lancium; and (3) Lancium's product offerings, such as its Smart Response service, use the technologies recited in the Asserted Claims. This Supplement reiterates and clarifies some of my earlier analysis in my Original Report and Reply Report in consideration of the Markman Order.

II. NEW INFORMATION CONSIDERED

[3] Since the dates of my Original Report and Reply Report, the Court issued the Markman Order setting forth explicit constructions for the plain and ordinary meaning of the terms "power option agreement" and "minimum power threshold."

[4] Specifically, the Court construed the term "power option agreement" to mean "an agreement between a power entity associated with the delivery of power to a load and the load, wherein the load provides the power entity with the option to reduce the amount of power delivered to the load up to an agreed amount of power during an agreed upon time interval such that the load must use at least the amount of power subject to the option during the interval unless the power entity exercises the option." Dkt. No. 218 at 7. The Court also construed the term "minimum power

threshold" to mean "a minimum amount of power a load must use during an associated time interval." *Id*. at 16.

[5] The Court's constructions of these terms do not change my opinions about Mr. Storms's conception and communication of his proprietary information to Lancium set forth in my earlier reports. Although I did not apply the Court's construction in my earlier reports, my opinions apply with equal weight under the Court's constructions, as I further explain below.

[6] Although I did not expressly apply these claim constructions in my earlier reports, my understanding of these claims terms is consistent with the Court's interpretation. This is evidenced in part by my deposition testimony below:

> Q: What's your understanding of the
> plain and ordinary meaning of power option agreement?
> A: My understanding of **power option agreement is**
> **it's essentially a contract to buy power at a certain**
> **price. It's like a wholesale purchase**. I'm going to buy
> X number of units at X price.
> Q: What's your understanding of **power option data**?
> A: **Power option data is the data that's associated**
> **with the power option agreement**.
> Q: What -- is there any specific data that's
> required to be power option data, or can it be anything?
> A: **I think at least it has intervals and minimum**
> **thresholds**. There may be other data that's associated
> with that, but I think there's thresholds over intervals.
> Q: And intervals are intervals of time?
> A: Time intervals, yeah.
> Q: **And what are thresholds**?
> A: You agree to buy power at that -- **you agree to**
> **consume that much power at a certain price at that time**.
> Q **You agree to buy that much power or consume**
> **that much power**?
> A: Typically it's consume because you're a load
> that's not controllable. **If you're a controllable load**,
> **then you're buying that power with the assumption that**
> **you're going to consume it**. If you have ability to sell
> it back, then you can sell it back. But you don't sell
> it back to whoever you bought it from, you sell it into a
> market at that time. **It's an agreement with the seller**
> **to consume, right**?
> And consume doesn't mean use. Consume means

purchase. **Whether I use that power to do something with or whether I sell that power to somebody else, that's separate from the power option agreement**.
Q: What's your understanding of a minimum power threshold in this case as used in the '433 patent?
A: That's the data that's associated with the option agreement.
Q: **What specifically is a minimum power threshold**?
A: **That's the amount of power that you're contracted to consume**.
Q: And by consume you don't mean use, correct?
A: I may not use it, but I'm going to consume it. I'm purchasing it. Whether I use it or whether I sell it, that's a completely separate issue. I'm agreeing to purchase it at that threshold[1]

[7] As my testimony shows, I understand the plain and ordinary meaning of the term "power option agreement" to be "an agreement with the seller to consume" an amount of power delivered to the load by a power entity that includes time intervals and "minimum power thresholds," which I understand to be "the amount you're contracted to consume" for that time interval. *Id*. These understandings are consistent with and nearly identical to the Court's interpretation of those terms in the Markman Order, and I may offer testimony at trial based on these opinions.

[8] As my deposition testimony cited above demonstrates, I was referring to my understanding of power option agreements in practice, specifically that if the grid exercises the option to reduce power delivery to the load, the load stops "using" that power as it is contractually obligated to do, but the load may be free to liquidate that unused power into the market through its QSE (e.g. sell it).

[9] During my deposition, it seemed to me that Defendants' counsel was attempting to attribute a particular type of consumption to the word "use," such as "use" being limited to "use to mine cryptocurrency." In the below portion of my deposition, I disagreed with that implication, and articulated my understanding of the meanings of "use" and "consume." I also mistakenly used

[1] Exhibit A, Deposition of Stan McClellan, at 83:5-84:22 (emphasis added).

the term "power purchase agreement" when referring to certain aspects of the "power option agreement," which I later acknowledged:

> Q So just to be clear so our -- **Your use of the word consume here means -- it doesn't mean physically the data center consumes the power by using it. It also could mean that the power is sold back**.
>
> A **Consume is a transactional thing. Right. The consumption is a transaction where I'm consuming it. I have to dispatch that power some way**.
>
> Q What do you understand the term performance strategy to mean in the context of the claims of the '433 patent?
>
> A A performance strategy is deciding -- is a decision based on incoming data and conditions and monitored conditions as to how to dispatch the -- **how to dispatch the power that's been consumed through the PPA against bitcoin miners or not**.
>
> Q So in your understanding of performance strategy could performance strategy be to not consume power?
>
> A It could be --
>
> Q I'm sorry. Let me -- I asked a bad question because I used the word consume in a different context. So in your understanding of the term performance -- the meaning of the term performance strategy, could a performance strategy be a decision for the load to not utilize power?
>
> A As long as it complies with the minimums, yeah.
>
> Q What minimums must it comply with?
>
> A **The minimum thresholds in the PPA**.
>
> Q If I understood -- if I understood -- You said PPA. I think the term from the patent is power option agreement.
>
> A Yeah. That's -- that's –
>
> Q Are you using the two -- Do you think there's a difference between -- Well, between a PPA which – What do you understand PPA to be?
>
> A **I may have just used the wrong term**. I meant the contracted purchase of power at a certain rate.
>
> Q Do you understand that the term -- do you understand there's such a thing called a power purchase agreement?
>
> A Yeah. I've heard of that.
>
> Q Do you understand –

A I think they're essentially the same thing, but I'm not exactly sure of the difference.
Q That was my next question. Is there a difference or not that you are aware of?
A **I tend to use them interchangeably, and that may not be exactly right**.[2]

[10] I note that the Court adopted my broader understanding of the term "consume" for both the terms "consume" and "use," which the Court found to be interchangeable. D.I. 218 at 9. I also note that the Court found that some, but not all, minimum power thresholds may be zero. *Id.* at 13, FN5.

[11] The Court's Markman Order also does not change my opinion on Mr. Storms significant contributions to the conception of the subject matter claimed in the '433 Patent. Mr. Storms made significant contributions to claim limitations other than, and in addition to "power option agreement" and "minimum power threshold"

III. CLARIFICATIONS OF MY OPINIONS CONCERNING PLAINTIFFS' CONCEPTION/POSSESSION OF AND COMMUNICATION OF THE INVENTIONS DESCRIBED IN THE '433 PATENT

[12] My opinions have not changed regarding BearBox's possession of the inventions recited in claims 1-20 of the '433 Patent prior to meeting and communicating with Mr. McNamara and Lancium. The Court's constructions of the terms "power option agreement" and "minimum power threshold" do not change my opinions, and my opinion still stands for at least the reasons set forth in my Original Report and Reply Report.

[13] In addition, I provide the following clarifications concerning the interaction between the power entity associated with the delivery of power to a load and the load in the system Mr. Storms conceived.

[14] The term "power option agreement" appears in claims 1, 6, 12, 17 and 19-20 and "minimum power threshold" appears in claims 1, 5-6, 13-14, 17 and 19-20.

[2] Exhibit A at 85-87.

Kaufmann, Adam

From:	Benjamin T. Horton <bhorton@marshallip.com>
Sent:	Friday, November 11, 2022 6:40 PM
To:	Nelson, Mark; Stover, Chad; Kaufmann, Adam; Hooker, Darrick; Sarros, Dana; Lisch, David; Pendroff, Benjamin; Butler, Nell; Lytle, Kathleen
Cc:	Ray Ricordati; Chelsea M. Murray; John Lucas; Deborah S. Pocius; Stacey Cummings; Jamie Daly; Heather R Malkowski; amayo@ashbygeddes.com; Myers, Nikki; Kipp, Michele L.; John R. Labbe
Subject:	[EXTERNAL]RE: BearBox v. Lancium - Supplement to Expert Reports of Dr. Stan McClellan

Mark,

Following up on this, Dr. McClellan's supplement considers the Court's October 28, 2022 Markman Order, so we're supplementing consistent with FRCP 26(e)(2). This supplement addresses issues raised in your Motion in Limine No. 1 and during the meet a confer process, at which time Defendants said that Dr. McClellan should not be allowed to testify in consideration of the Court's Markman Order.

We are open to discussing a schedule for your expert to respond to this supplement, should he wish to do so. Please let us know if you'd like to talk; we're generally available early next week.

Best,
Ben

From: John R. Labbe <jlabbe@marshallip.com>
Sent: Friday, November 11, 2022 5:16 PM
To: Nelson, Mark <mnelson@btlaw.com>; Stover, Chad <Chad.Stover@btlaw.com>; Kaufmann, Adam <Adam.Kaufmann@btlaw.com>; Hooker, Darrick <Darrick.Hooker@btlaw.com>; Sarros, Dana <Dana.Sarros@btlaw.com>; Lisch, David <David.Lisch@btlaw.com>; bpendroff@btlaw.com; Butler, Nell <Nell.Butler@btlaw.com>; Lytle, Kathleen <Kathleen.Lytle@btlaw.com>
Cc: Benjamin T. Horton <bhorton@marshallip.com>; Ray Ricordati <rricordati@marshallip.com>; Chelsea M. Murray <cmurray@marshallip.com>; John Lucas <jlucas@marshallip.com>; Deborah S. Pocius <DPocius@marshallip.com>; Stacey Cummings <SCummings@marshallip.com>; Jamie Daly <jdaly@marshallip.com>; Heather R Malkowski <hmalkowski@marshallip.com>; amayo@ashbygeddes.com; Myers, Nikki <NMyers@ashbygeddes.com>; Kipp, Michele L. <MKipp@ashbygeddes.com>
Subject: BearBox v. Lancium - Supplement to Expert Reports of Dr. Stan McClellan

Counsel,

I attach a Supplement to Expert Reports of Dr. Stan McClellan.

John

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GERSTEIN ip

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stopped to ask who the true inventors are, instead naming Lancium co-founders, Cline and McNamara, as inventors. But intent is not an element of an inventorship determination.

In its attempt to distract from the merits, Lancium contradicted itself during trial, arguing that Storms' documents are "inscrutable" with "infinite settled mathematical formulary," but months earlier said his documents were nothing more than "trivial math calculations." Yet in 2019, Lancium internally described the inventions as "new," creating an "opportunity bigger than we yet realize," and used those inventions to raise $150 million.

II. Storms is the Sole Inventor of the Inventions Claimed in the '433 Patent

Storms is the sole inventor of the inventions claimed in the '433 Patent. "There is a presumption that the inventors named on an issued patent are correct," so an inventorship claim "must be proven by facts supported by clear and convincing evidence." *Univ. of Colorado Found., Inc. v. Am. Cyanamid Co.*, 342 F.3d 1298, 1308 (Fed. Cir. 2003). To do so, Storms must prove that he conceived every element in each claim of the '433 Patent and that he communicated the invention to McNamara and/or Cline, who in turn derived the claimed subject matter from Storms' disclosures. *Id*. Storms "must establish prior conception of the claimed subject matter and communication of the conception to" Lancium. *Price v. Symsek*, 988 F.2d 1187, 1190 (Fed. Cir. 1993). Storms can satisfy the communication requirement with "corroborating evidence of a contemporaneous disclosure that would enable one skilled in the art to make the invention." *Univ. of Colorado*, 342 F.3d at 1308 (quoting *Burroughs Wellcome Co. v. Barr Lab'ys, Inc.*, 40 F.3d 1223, 1228 (Fed. Cir. 1994)).

A. Storms conceived of his cryptocurrency mining system and reduced it to practice by early 2019, as corroborated by contemporaneous documents and communications

"The test for conception is whether the inventor had an idea that was definite and permanent enough that one skilled in the art could understand the invention; the inventor must

prove his conception by corroborating evidence, preferably by showing contemporaneous disclosures." *Univ. of Pittsburgh of Commonwealth Sys. of Higher Educ. v. Hedrick*, 573 F.3d 1290, 1298 (Fed. Cir. 2009). "An inventor need not know that his invention will work for conception to be complete." *Id.* Rather, Storms "need only show that he had the complete mental picture [of the claimed inventions] and could describe [them] with particularity." *Id.* To be named the inventor of the Patent, Storms must only prove that he conceived "the *subject matter* of the claims," not the words McNamara and Cline chose to use. *Ethicon, Inc. v. U.S. Surgical Corp.*, 135 F.3d 1456, 1460 (Fed. Cir. 1998) (emphasis added). Whether Storms' inventorship claim is "sufficiently corroborated is evaluated under a 'rule of reason' analysis." *Id.* at 1461.

In an effort to develop a marketable cryptocurrency mining solution, Storms conceived of his system, developed it, and reduced it to practice from late 2018 through early 2019, before meeting anyone from Lancium. PF 1-10. Storms sketched out algorithms and ideas on a whiteboard, wrote dozens of source code files, constructed a custom power distribution unit, and documented his efforts with photographs, emails, and metadata-preserved files. *Id.*; *Trovan, Ltd. v. Sokymat SA*, 299 F.3d 1292, 1302 (Fed. Cir. 2002) (the most reliable form of corroborating evidence takes the form of "physical records that were made contemporaneously with the alleged prior invention."). In addition, Storms reduced his system to practice, choosing exemplary values for variables,[1] simulating real-world conditions, successfully operating his invention as a proof of concept. PF 8, 16. *Trovan*, 299 F.3d at 1309 ("[R]eduction to practice alone is evidence that [a purported inventor] had a definite and permanent idea of the complete and operative

[1] *Ex Parte Christopher S. Wilson & Viresh Rustagi*, 2013 WL 4096429, at *4 (P.T.A.B. Aug. 7, 2013) ("[O]ne of ordinary skill in the art [of computer software] would know that variables contain values, i.e., a variable is 'a named storage location capable of containing data that can be modified during program execution.'") (quoting Microsoft Computer Dictionary, Fifth Edition, Microsoft Press (2002), at 947).

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Spec Sheet, and Data File. *Id*. McNamara immediately reviewed Storms' message and attachments and forwarded them to Eric Kutscha, Director of Engineering, John Cohen, CFO, and Raymond Cline, Chief Computing Officer and named co-inventor of the '433 Patent. PF 12. *Blue Gentian v. Tristar Products, Inc.*, 2020 WL 241345, at *8-14 (D.N.J. 2020) (finding named inventor's "eagerness" to receive purported inventor's information, and subsequent distancing, to be relevant evidence to inventorship determination).

Cline admitted that he may have discussed Storms' documents with McNamara more than once, although at trial he changed his story. PF 65. While Cline claimed at trial that metadata on his computer suggested he never downloaded Storms' Data File until April 2021, Lancium never produced any such metadata, and the metadata Lancium actually produced shows that Cline was the custodian of a copy of Storms' Data File with a created date of May 9, 2019, and a suffix of "(1)," indicating Cline had downloaded the file multiple times. PF 65; *Ethicon, Inc. v. U.S. Surgical Corp.*, at 1462 ("[named inventor]'s trial testimony clashed with his earlier deposition testimony").

1. Independent claims 1, 17, and 20

a. "A system comprising: a set of computing systems configured to perform computational operations using power from a power grid"

Storms' system includes a set of computing systems configured to perform computational operations (*e.g.*, cryptocurrency mining) using power from a power grid. PF3, 6, 12 15. No later than April 11, 2019, Storms conceived of a system that included a set of computing systems (*e.g.*, cryptocurrency miners), configured to perform computational operations (*e.g.*, mine cryptocurrencies) using power from a power grid provided through a remotely-controllable power distribution unit (PDU). *Id*. Storms' conception is corroborated by contemporaneous documents, including at least source code, specifications, system diagrams, comma-separated

value data files, photographs, emails, and text messages. *Id*. Claims 17 and 20 do not require using power from a grid, but otherwise have substantially the same claim limitations as claim 1. PF 38.

Storms communicated this claim element to Lancium at least because his documents, including the Spec Sheet and Data File, describe that his systems' 272 miners each consumed about 1.3 kW per hour, for a maximum amount of about 373 kW per hour, or about 31 kW per 5-minute interval. PF 16-17. Storms' Spec Sheet also noted specific types of miners, including a Bitmain S9, Dragonmint T1, or "similar." *Id*. Further, Storms' system was designed to use power from a power grid, as defined in the '433 Patent. A grid includes a power generation source, such as a windfarm, and Storms' system is plainly connected to a windfarm (or other generation source). PF 18, 49.

b. "a control system configured to: monitor a set of conditions"

No later than April 11, 2019, Storms conceived of a system that was configured to monitor a set of conditions, including Bitcoin price, hashrate, network difficulty, the real-time market price for electricity, the day-ahead market price for electricity, power usage, and the state of the miners, such as whether a miner was on or off and its recent performance metrics. PF 7, 10, 19. His conception is corroborated by contemporaneous documents, including at least source code, specifications, system diagrams, comma-separated value data files, photographs, emails, and text messages. *Id*. Storms communicated this claim element to Lancium at least because Storms' documents, including the Spec Sheet, Diagram, and Data File, describe the ability of the system to monitor various conditions, such as real-time locational marginal pricing (LMP), day-ahead LMP, Bitcoin price, network difficulty, and network hashrate. PF20-22. Lancium did not dispute this element at trial.

c. "receive power option data based, at least in part, on a power option agreement, wherein the power option data specify: (i) a set of minimum power thresholds, and (ii) a set of time intervals, wherein each minimum power threshold … is associated with a time interval"

Storms' Diagram, as sent to McNamara, shows a windfarm generating electricity with the option to either sell that electricity to the grid or to use that electricity for mining Bitcoin. PF 23-29, 33. The electricity is depicted as a lightning bolt, and the electricity enters what is depicted as a pipe with two paths: one connected to the grid where electricity can be sold, and another connected to a Bitcoin mining load where electricity can be consumed to mine Bitcoin. *Id*. This Diagram alone is sufficient evidence to overcome Lancium's argument that Storms did not conceive of a "power option agreement" as claimed in the Patent. The Court construed the term "power option agreement" to mean "an agreement between a power entity associated with the delivery of power to a load and the load, wherein the load provides the power entity with the option to reduce the amount of power delivered to the load up to an agreed amount of power during an agreed upon time interval such that the load must use at least the amount of power subject to the option during the time interval unless the power entity exercises the option." D.I. 219 at 7, 16. In Storms' diagram, the windfarm is a "power entity" (it is "associated with the delivery of power to a load"). And the windfarm has the option of selling to the grid or providing power to the load to consume for Bitcoin mining. PF 24-25, 33. The Court further construed the term "minimum power threshold" to mean "a minimum amount of power a load must use during an associated time interval." Storms' Diagram depicts the Bitcoin mining load using power in 5-minute increments whenever the windfarm elects to use the power for mining rather than sell it to the grid (which sale would occur in 5-minute increments). PF 30-32.

(i) In Storms' system, the generator sells power

Storms' documents, including the Spec Sheet, Diagram and Data File, describe an

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electrical connection between a power generation facility (windfarm) and a load, depicted by a lightning bolt and what is illustrated as a pipe. PF 29, 33. The contractual arrangement between the load and the generator could vary, but the presence of the connection between the two implies that they have agreed on a contractual arrangement defining how power would be delivered, at what price, and the like. PF 23-29, 33.

Storms' Diagram shows the generator with the option to sell power, depicted as dollar signs, because the generator is the entity that creates, owns, and delivers the power. PF 33. Because the generator business model is to generate, sell, and deliver power to the grid, a POSA would have understood (1) the generator already had both the functional capacity and compliance with existing regulatory/administrative requirements to do so, and (2) that this disclosure reflects that the generator must curtail power delivered to the load (the BearBox) in order to optionally sell power to the grid in 5-minute increments. PF 25, 29-33.

(ii) Storms' system operated on ERCOT 5-minute intervals

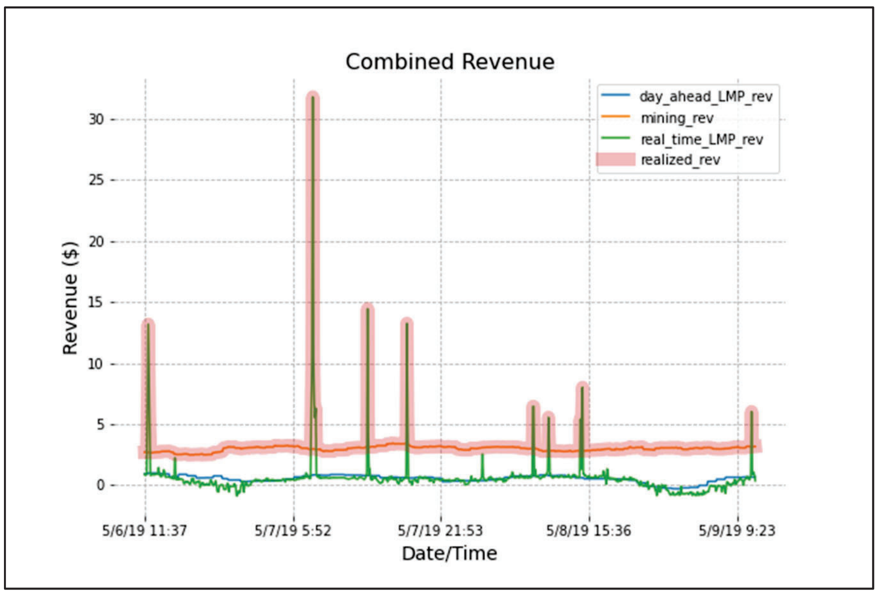
Storms' documents show that his system operated on 5-minute intervals. The Data File described in explicit detail how the various conditions monitored by the system were used to determine a mining strategy (*e.g.*, to mine or not mine) every 5 minutes. PF 5, 26, 30-32. No claim requires the interval to change in duration. TX1.

(iii) Storms' system maintained energy usage for the duration of each interval

Storms' system will continue to mine—and thereby use energy—for the duration of the 5-minute interval. PF 26-27, 30-32. Because Storms' system employed a remotely-controllable PDU addressable using network-based commands, Storms' logically separated decision-making control logic from the lower level PDU—which turned miners on/off and thereby controlled power consumption. PF 6, 28. This logical separation enabled Storms' decision-making control

logic to issue commands to the PDU from virtually anywhere. Upon receipt of the commands, the PDU will fulfill its obligation by turning on/off miners and wait for the duration of the interval for the next command. *Id*. In other words, because the PDU is not capable of overriding these commands, the load in Storms' system—the PDU and miners—are obligated to use the amount of power corresponding to the number relay commands issued by the higher-level control logic. PF 6, 26-28. These concepts represent the Court's construction for a minimum amount of power a load must use during an associated time interval. D.I. 218 at fn. 3 (finding minimum power threshold may be zero for some intervals), 16.

As shown in a graph based on the data in Storms' Data File, in some instances, the most profitable option (highlighted in pink) was to mine Bitcoin (shown as the red line), while in other instances, the most profitable option was to sell energy to the grid when the current price of energy spiked (shown as the green line). PDX3.24. Of the eight-hundred twenty-five (825) 5-minute intervals shown in the Data File, the system monitored conditions, determined a performance strategy using breakeven and revenue generation calculations, and instructed miners to utilize energy to mine for the duration of 822 intervals. PF 32. Storms' System instructed the miners to stop in 23 instances. *Id*. In other words, the system as described in the Data File continuously mines Bitcoin except for limited instances when the miners are instructed to stop consuming power. *Id*.



(iv) Storms' system was capable of operating at incremental power levels

Nothing in claim 1, or any other claim, requires the curtailment of less that the full amount of power being used by the system. TX 1. Though the claims require more than one "minimum power threshold," the Court construed the term such that a minimum power threshold may be zero, as long as not all minimum power thresholds are zero. D.I. 218 at fn. 3. Thus, Storms' systems' ability to fully curtail power usage, down to zero, in each interval from a system maximum power consumption level fully satisfies this aspect of claim 1.

Even if claim 1 did require the system to operate at some intermediate power level, Storms designed his system with different types of miners having different operational characteristics, such as power thresholds, operating frequencies, and more. PF 8, 16. Storms' documents explicitly state that his system includes 272 miners, individually controllable, consisting of a collection of "Bitmain s9, Dragonmint T1 or similar" miners. *Id*. Storms' source code files also define the varying power thresholds and performance characteristics for several different specific miners. *Id*. The use of these different miners would result in different power usage levels. *Id*.

Storms' custom PDU employed multiple, individually controllable relays that each powered an associated set of Bitcoin miners (*i.e.*, computing systems). PF 6. To communicate with and control various aspects of the cryptocurrency miners, Storms utilized the industry standard, open-source software referred to as "cgminer." PF 7. Storms' design enabled fine-grain load control—such as the ability to turn on some, but not all, miners—so that power usage and/or system performance could be dynamically manipulated in response to changing conditions. PF 6, 8, 37. All of these capabilities were communicated to Lancium in the Diagram, Spec Sheet, and Data File. *Id*.

d. "responsive to receiving the power option data, determine a performance strategy … based on a combination of at least a portion of the power option data and at least one condition …, wherein the performance strategy comprises a power consumption target for the set of computing systems for each time interval … wherein each power consumption target is equal or greater than the minimum power threshold associated with each time interval"

No later than April 11, 2019, Storms conceived of a system responsive to receiving the power option data, configured to determine a performance strategy, and based on a combination of at least a portion of the power option data and at least one condition, wherein the performance strategy comprises a power consumption target for the set of computing systems for each time interval, wherein each power consumption target is equal or greater than the minimum power threshold associated with each time interval, such as the 5-minute increments upon which the BearBox system would reevaluate and reinstruct its miners whether to consume power by mining or not. PF 32, 34.

Storms communicated this claim element to Lancium at least because the Storms' documents, including the Data File, describes the operation of Storms' source code, showing for each of eight-hundred twenty-five (825) 5-minute intervals, that the system monitored conditions, determined a performance strategy using breakeven and revenue generation calculations, and instructed miners to utilize energy to mine or instructed the miners to stop mining when curtailment was required. PF 32. In 822 of those intervals, the system used energy for the duration of that interval to mine Bitcoin; in the remaining 23 intervals, the miners were instructed to stop mining. *Id*. In other words, the system as described in the Data File continuously mines Bitcoin except for limited instances when the miners are instructed to stop consuming power. *Id*. The Diagram also shows these alternating periods of mining (shown with Bitcoin symbols) and curtailment/sellback activities (shown with dollar signs), as Lancium's

expert admits. PF 27, 31 (McClellan and Baer).

e. "provide instructions to the set of computing systems to perform one or more computational operations based on the performance strategy"

No later than April 11, 2019, Storms conceived of a system that provide instructions to the set of computing systems to perform one or more computational operations based on the performance strategy, e.g. mine cryptocurrencies, using power from a power grid provided through a remotely-controllable power distribution unit (PDU). PF 3, 6, 12 15, 36. Storms' conception is corroborated by contemporaneous documents, including source code, specifications, system diagrams, comma-separated value data files, photographs and email and text messages. *Id*.

This aspect of claim 1 was communicated to Lancium on May 9, 2019 at least because the Storms' Communication describes control systems' remotely controllable PDU, which enabled fine-grain load control of the systems 272 miners of varying types. PF 37. In one example using Bitmain S9 miners, each miner consumed about 1.3 kW per hour, for a maximum amount of power consumption of about 373kw per hour, or about 31 kW per 5-minute interval (about .1 kW per miner). *Id*.

2. Dependent claims

a. Claims 2-5

Dependent claims 2-5 depend from claim 1, and add specific data—power price and parameters associated with the computational operations to be performed—that is monitored and used in determining and implementing a performance strategy. PF 39. As explained above with respect to claim 1, Storms' system monitored real-time and day-ahead power prices and various parameters associated with Bitcoin mining computational operations, such as Bitcoin price, network hashrate and difficulty, and used this data in the manner recited in the claims. *Id*.;

Section II(B)(1). Storms' conception is corroborated by contemporaneous documentation, including at least source code, specifications, system diagrams, comma-separated value data files, and email messages. *Id*. Storms also communicated this information to Lancium for the reasons set forth above with respect to claim 1. *Id.*

b. Claims 6-8, 13-14 and 19

Dependent claims 6-8, 13-14 and 19 depend from either claim 1 or 17, and add the use of power option data for subsequent intervals, which is used in determining and implementing a revised performance strategy. PF 40. As explained above with respect to claim 1, Storms' system used monitored conditions and power option data over multiple, consecutive intervals in the manner recited in the claims. *Id*.; Section II(B)(1) (infra). Storms conception is corroborated by contemporaneous documentation, including at least source code, specifications, system diagrams, comma-separated value data files, and email messages. *Id*. Storms also communicated this information to Lancium for the reasons set forth above with respect to claim 1. *Id*. Lancium did not separate contest the conception of these claims.

c. Claims 9-12 and 18

Dependent claims 9-12 and 18 depend from either claim 1 or claim 17, and add conventional features well-known in the art, each of which was incorporated into Storms' system and communicated to Lancium. PF 41. For example, claim 9 requires the control system be positioned remotely from the set of miners. *Id*. Storms' system included such functionality via its remotely controllable PDU. *Id*. Similarly, claim 10 requires the control system run on a mobile computing device, such as Storms' laptop. *Id*. Claim 12 adds that power option data is provided by a QSE, functionality that had been used in ERCOT for 20 years. *Id*. Storms conception is corroborated by contemporaneous documentation, including at least source code, specifications, system diagrams, comma-separated value data files, and email messages. *Id*. Lancium did not

separately contest the conception of these claims.

With respect to claim 18, Storms showed that the cgminer software he used provided the ability to increase the frequency at which the miner's operate. PF 7, 42.

d. Claim 16

Dependent claim 16 closely aligns with all aspects of Storms' system. Claim 16 depends from claim 1, and adds specific data—"a price of power from the power grid; and a global mining hash rate and a price for a cryptocurrency"—and use that information to determine the performance strategy that instructions at least some miners "to perform mining operations for the cryptocurrency when the price of power from the power grid is equal to or less than a revenue obtained by performing the mining operations for the cryptocurrency." PF 42. Storms' system compared mining profitability and instructed miners to mine Bitcoin when mining revenue was greater than the price of power from the power grid as recited in claim 16. PF 42; Section II(B)(1). Storms also communicated this information to Lancium for the reasons set forth above with respect to claim 1. *Id*.

Specifically, as shown in the Data File, Storms' system compared the revenue obtained by performing mining operations for Bitcoin (mining_rev, column H), and mined Bitcoin in circumstances in which the price of power from the grid (real_time_LMP, column J) was equal or less than the revenue obtainable from mining Bitcoin. PF 43**.**

C. After Storms communicated the inventions to them, McNamara and Cline did not independently conceive of the inventions

To prove his sole inventorship claim, Storms need only prove that he conceived of the claimed inventions and communicated those inventions to McNamara (and in turn, Cline). *Price*, 988 F.2d at 1190. After receiving Storms' documents, McNamara and Cline could not "independently" conceive of the inventions without knowing what Storms disclosed to them.

McNamara and Cline admit they did not conceive of the claimed inventions until the period of August through October 2019, months after Storms disclosed his system to them. PF 57-58. By then, they already have the benefit of Storms' disclosures. Lancium's tale of independent inventorship lacks support. Although Lancium flooded the court with voluminous documents showing that it was working on various projects before May 9, 2019, and working to implement various embodiments of the claimed inventions in late 2019, Lancium failed to present testimony or documents to sufficiently explain any independent inventorship theory. Neither Cline nor McNamara described their inventive activities such as the problem they set out to solve, why they solved it, how they solved it, or when they solved it.

According to Dr. Ehsani, Lancium had a "flash of insight" in August 2019 that led to the inventions of the '433 Patent, but the supporting email just describes how a third-party electricity broker explained a 20-year-old ERCOT market participant rule to Cline that he apparently did not already understand. PF 61. Lancium used this understanding to implement a particular embodiment of the claimed inventions to allow it to offer ancillary services. This supposed "flash of insight" does not show that Cline or McNamara invented anything. At most, this "flash of insight" relates to Lancium's efforts to commercialize an embodiment of Storms' inventions. This "flash of insight" is not conception; it is at best (late) recognition of a well-known, conventional form of commercializing a system within ERCOT and is therefore not inventorship. *FilmTec Corp. v. Hydranautics*, 982 F.2d 1546, 1552 (Fed. Cir. 1992) (commercialization is "certainly not required" for conception); *Eli Lilly & Co. v. Aradigm Corp.*, 376 F.3d 1352, 1362 (Fed. Cir. 2004) ("A contribution of information in the prior art cannot give rise to joint inventorship because it is not a contribution to conception.")

III. Alternatively, Storms Is at Least a Joint Inventor of the '433 Patent

To be a joint inventor, an individual "must contribute to the invention's conception."

CODA Dev. S.R.O. v. Goodyear Tire & Rubber Co., 916 F.3d 1350, 1358 (Fed. Cir. 2019). However, the "proof of conception by joint inventors *is not the same* as proof required of a sole inventor." *Coleman v. Dines*, 754 F.2d 353, 361 (Fed. Cir. 1985) (emphasis added). This is because a joint inventor does not need to "contribute to every claim—a contribution to one claim is enough." *Id*. In fact, an alleged inventor need not even "contribute[] to the conception of all the limitations in any one claim of the Patent." *Eli Lilly and Co. v. Aradigm Corp*., 376 F.3d 1352, 1359 (Fed. Cir. 2004). Rather, "the law requires only that a co-inventor make a contribution to the conception of the subject matter of a [single] claim." *Id*. As with sole inventorship, a "rule of reason" analysis is applied to determine corroboration in the context of joint inventorship. *Price*, 988 F.2d at 1195. Under this analysis an evaluation of all pertinent evidence must be made. *Id*.

Moreover, it is not necessary that "the entire inventive concept should occur to each of the joint inventors," so long as each inventor "makes some original contribution, though partial, to the final solution of the problem." *Kimberly-Clark Corp. v. Procter & Gamble Distributing Co.*, 973 F.2d 911, 916–917 (Fed. Cir. 1992).

1. Storms' communications with Lancium satisfied the collaboration required for joint inventorship

To be joint inventors, there must be "some element of joint behavior." *Kimberly-Clark Corp. v. Procter & Gamble Distrib. Co.*, 973 F.2d 911, 917 (Fed. Cir. 1992). However, all that is required is "some quantum of collaboration or connection." *Id*. As such, "[t]he test for establishing a quantum of collaboration between a party and named inventors is not demanding and . . . has been satisfied by such tenuous collaborations as one inventor seeing the report of another and building upon it, or merely hearing an inventive suggestion at a meeting." *Arbitron, Inc. v. Kiefl*, 2010 WL 3239414, at *5-6 (S.D.N.Y. Aug. 13, 2010); *see also Coca-Cola Co. v.*

Pepsico, Inc., 2004 WL 4910334, at *39 (N.D. Ga. Sept. 29, 2004) (discussing "the low threshold of collaboration" required); *Kimberly-Clark Corp. v. Procter & Gamble Distrib. Co.*, 973 F.2d 911, 917 (Fed. Cir. 1992) ("one inventor seeing a relevant report and building upon it or hearing another's suggestion at a meeting" meets collaboration requirement).

That said, to establish sufficient collaboration, "[t]he inventors need not work physically together or contemporaneously to be joint inventors; nor must each inventor contribute equally or to each claim of the patent." *Univ. of Pittsburgh of Commonwealth Sys. of Higher Educ. v. Hedrick*, 573 F.3d 1290, 1297 (Fed. Cir. 2009). Accordingly, Storms proved this aspect of joint inventorship by his conversations with McNamara and the ensuing exchange of messages and documents (as discussed in greater detail above). PF 12.

2. Storms' contributions were significant in both quantity and quality

To qualify as a joint inventor, an individual's contribution must be "not insignificant in quality, when that contribution is measured against the dimension of the full invention." *Fina Oil & Chem. Co.*, 123 F.3d 1466, 1473 (Fed. Cir. 1997). However, there is "no explicit lower limit on the quantum or quality of inventive contribution required for a person to qualify as a joint inventor." *Fina Oil*, 123 F.3d at 1473. Joint inventors need not (1) "physically work together or at the same time," (2) "make the same type or amount of contribution," or (3) "make a contribution to the subject matter of every claim of the patent." *Vanderbilt Univ. v. ICOS Corp.*, 601 F.3d 1297, 1302 (Fed. Cir. 2010) (citation omitted).

a. "Monitored conditions"

Storms' contribution of monitored conditions, as recited in all 20 claims, was a significant contribution that forms a basis upon which the other aspects of the claim are built. As explained above, Storms' system monitored the same set of conditions identified in the '433 Patent—Bitcoin price, hashrate, network difficulty, the real-time market price for electricity, the

day-ahead market price for electricity, power usage and the state of the miners, such as whether a miner was on or off and its recent performance metrics. Section II(B)(1)(b). In contrast, Lancium's system as late as May 7, 2019, only monitored energy price and shut down miners when the price of power was too high. PF 51.

b. Claim 16

Storms also made a significant contribution in the form of his profitability analysis embodied in claim 16. Specifically, as shown in the Data File, Storms' system compared the revenue obtained by performing mining operations for Bitcoin (mining_rev, column H), and mined Bitcoin in circumstances in which the price of power from the grid (real_time_LMP, column J) was equal or less than the revenue obtainable from mining Bitcoin. PF 43.

IV. Under the Rule of Reason, Lancium's Actions and Inactions are Pertinent Evidence of Storms' Inventorship

Before meeting Storms, Lancium's business was premised exclusively on cheap power; turning Bitcoin miners off to avoid high prices. PF 51. Within weeks of meeting Storms and receiving his documents, Lancium began commercializing his concepts by monitoring electricity market pricing and variables informing Bitcoin mining profitability to form strategies for monetizing Bitcoin miner downtime; rather than avoiding high prices, Lancium would profit from them. PF 52. For example, by August 2019 Lancium fixed its electricity price and began voluntarily shutting down miners when real-time electricity prices exceeded mining profitability for particular time intervals, selling blocks of unused electricity back to the grid. Lancium also pursued a CLR designation (at the suggestion of an electricity broker) so Lancium could sell its capacity to the grid for a fee, allowing the grid to shut down Lancium' miners under similar high price conditions (during which Lancium could also sell-back the unused power). At most, Lancium's activities amount to commercializing Storms' concepts with known, conventional

provides much greater flexible and adaptability compared to compiled code. 314:8-12; 362:8-17; 381:24-383:23 TX24, TX20; TX32; TX46; TX157.

10. Storms' system monitored RTM LMP and DAM LMP, as well as Bitcoin price, network difficulty, and network hashrate. 283:15-286:9; 288:19-22; 298:15-301:15; 312:3-7; 315:4-316:9; 314:13-15; 318:6-22; 319:20-22; 320:8-15; 322:4-323:14; TX24, TX32; TX46; TX47; TX49; TX157.

11. GlidePath never invested in Storms' technology, deeming it too "revolutionary" for its investors. TX985.1.

II. Storms communicated details about his system to McNamara and Cline

12. On Friday, May 3, 2019, Storms attended a cryptocurrency conference in Boston. 77:18-78:18; TX52.2. He met McNamara of Lancium at a cocktail reception, and attended dinner with McNamara, one other Lancium executive, and a few other conference attendees. 78:19-79:23; 82:14-83:2. He sat across from McNamara at dinner, and McNamara responded favorably to information about Storms' system. 83:3-84:23; 601:13-24. McNamara remembers that Storms discussed his system in the context of a project for Glidepath, a wind farm operator. 601:13-24. McNamara was interested in the logic behind Storms' system. 90:9-90:22. The two agreed to follow up, and did beginning that weekend by text message. 84:24-85:2; 91:19-93:10; TX52.2. McNamara said: "your boxes may have some benefits vs the ones we are doing with JB driver," and "lots of stuff to

57. Lancium has not provided a clear, corroborated version of its alleged conception of the inventions claimed in the ’433 Patent. Lancium originally argued its conception was sometime “prior to the filing [of the provisional application] on October 28, 2019.” TX5.7. Lancium then argued “many (and potentially all) of the elements of each of the claims of the ‘433 patent had been conceived by no later than April 2019.” TX5.12. Finally, Lancium admitted that its conception was after Storms’ conception, stating that “the full combination of elements claimed in the ’433 patent were conceived between August 2019 and October 2019.” TX5.33.

58. Lancium admits that even under its theory of conception, many unspecified limitations and combinations of limitations were not conceived of by McNamara or Cline until August 2019 to October 2019. TX5.14 (*e.g.* any limitations “relating to” power option agreements, power option data, determining a performance strategy, and combinations of elements including those limitations, or related limitations were not conceived until “between approximately August 2019 and October 2019.”)

59. Lancium admits that it never reduced to practice the inventions claimed in the ’433 Patent prior to filing the Provisional Application. TX5.13.

60. McNamara and Ehsani found Storms Data File to be “inscrutable” because the Data File included hard-coded values meaning “there are infinite settled mathematical fomulary that could result in the[] numerical values,” though just six

providing a second, independent reason why Storms cannot be the sole inventor.

Nor is Storms a joint inventor. Storms made no contribution to the claim inventions, let alone a contribution that is significant in quality when measured against the full invention, as required by the law. And there was no collaboration between Storms and McNamara. DF20.

Finally, Plaintiffs' conduct and its witnesses' lack of credibility undermine its allegations. For example, the ideas Storms maintains are his originated with third-parties (Hakes and Labij). DF33-DF37. Storms repeatedly made his purportedly valuable technology public, including putting his Drawing on Twitter. DF32. Storms brought this case only after learning of Layer1's settlement with Lancium, and Storms' uncensored messages reveal his true motivation for bringing suit— to "blackball" McNamara from the industry. DF44-45, 49. Finally, Plaintiffs' evolving theories and definitions of their purported technology (*compare* D.I. 1, 19, 103), combined with their expert McClellan's repeatedly inconsistent testimony must be considered under the rule of reason. DF46-47. He who seeks equity must do equity. Plaintiffs do not abide by that maxim.

I. THE PARTIES AND THEIR COMMUNICATIONS

<u>Plaintiffs.</u> BearBox was founded by Storms in late 2018. DF12. BearBox makes no products, has one employee (Storms), and has no assets. DF12. Throughout its history, BearBox sold one mining container (box) for no profit. DF12. Prior to May 3, 2019, Storms had never met or heard of McNamara or Lancium. DF13.

<u>Defendants.</u> McNamara and Cline are co-founders of Lancium, which was formed in November 2017. DF1-3. McNamara is Lancium's CEO. DF1. Cline, who has a Ph.D., personally mined Bitcoin from approximately 2015-2017, and has experience in computer programming and smart grid technology. DF2. Lancium's initial vision was to put flexible datacenters (*e.g.*, Bitcoin miners) next to windfarms (*i.e.*, co-locate) to take advantage of the windfarms' highly variable power output and the highly variable power prices. DF3. Specifically, when power prices were

high, Lancium would ramp-down (curtail) its datacenters to allow the windfarm to sell that power to the grid, but when power prices were low Lancium would ramp-up its datacenters to provide the windfarm with a market for such low-priced power. DF3.

From the beginning, Lancium focused on protecting its inventions. DF4. The '632 application, for example, has a priority date of January 2018, and taught, among other things, a set of computing systems (*e.g.*, Bitcoin miners) configured to perform computational operations, a control system that monitored conditions, including directives, economic considerations (*e.g.*, real-time price of power, Bitcoin price), and other information that permitted Lancium to determine when a ramp-up condition was met based on the monitored conditions, to set a strategy for targeted power consumption, and to issue instructions to the computing systems (*e.g.*, individual miners or groups of miners) to perform computing operations. DF4.

By Summer and Fall of 2018 Lancium had built and successfully tested a working system at its R&D facility with 120 miners that were controlled using Lancium-modified software from Tier44 and ServiceNow. DF5. By this time, Lancium had conceived of (i) monitoring information, including power price, Bitcoin price, global hashrate, LMP, and ERCOT parameters, (ii) calculating the breakeven price for different types of miners, (iii) implementing a performance strategy based on the foregoing information, and (iv) instructing the miners in accordance with that strategy. DF4-DF5. Lancium successfully tested its system in September 2018. DF5.

Lancium continued to develop its technology and by May 1, 2019, had developed its own software (the Lancium Brain) and conceived of a system (referred to as Soft Load Control (DF6)) that, among other things, (i) used APIs to pull information (*e.g.*, LMP data from ERCOT), (ii) monitored signals from the windfarm, ERCOT, the miners themselves (*e.g.*, their actual power utilization), the Bitcoin price, global hashrate, and block height, (iii) used that information to

determine a target power level, and (iv) sent instructions to some or all of the computing devices (*i.e.*, miners) to suspend or restart their hashing algorithms accordingly. DF6. Lancium's system also continued to monitor the signals such that if a Load Limit Setpoint (LLS) changed (*e.g.*, decreased or increased) the software would respond by incorporating the new information into its calculus and reduce/increase the power utilization accordingly to below the new LLS value within the compliance period. DF6 (Figure 4-1 of TX320 at 24333-34).

Lancium was also working with JV Driver/Ready Engineering on designing and manufacturing mining containers, and as of May 1, 2019, Lancium was considering 40' boxes holding 1428 miners using 2MW power, that met applicable safety/security standards. DF7.

McNamara first learned about demand response programs and how they can reduce the effective price of power by May 2, 2019 (before meeting Storms) and the natural progression of these discussions and Lancium's further investigation led to McNamara and Cline learning about ancillary services (a type of demand response), which, in turn, led to McNamara and Cline's conception of using their miner ramping technology to provide ancillary services, under the constraint of a power option agreement, ultimately leading to the '433 patent. DF8-9, 13

The Parties' Communications. On May 3, 2019, Storms attended a Bitcoin mining conference in Boston to try to sell his Bitcoin mining container. DF13. McNamara attended the same conference. DF13. After being introduced at the happy hour, McNamara, Storms, and approximately six others went to a casual business dinner with friendly competitors talking shop. DF13-14. There was drinking and talking among the attendees, including between Storms and McNamara, and both spoke in normal tones of voice. DF14, DF20. Storms did not provide McNamara any documents during dinner, but contact information was exchanged. DF15, DF20.

Storms and McNamara communicated by text message after the dinner. DF15, 17-18, 20.

I. MCNAMARA AND CLINE INDEPENDENTLY INVENTED THE '433 PATENT

1. Michael McNamara is the CEO and a co-founder of Lancium. Tr. 532:25-533:3. McNamara is not a lawyer and does not understand the rules of claim construction, but does understand that a patent is a legal document. Tr. 605:4-19.

2. Raymond (Ray) Cline has a B.S. degree in chemistry and a Ph.D. in chemical physics. Tr. 432:6-7, 432:12-16. He has computer programming experience and experience with smart grid technology. Tr. 432:17-434:2. During the 2015-2017 timeframe, Cline personally mined Bitcoin and became familiar with the terms used in Bitcoin mining and their meanings, including "miner hashrate"/"hashrate," "global hashrate"/"network hashrate," "network difficulty," "block height," and "Bitcoin price." Tr. 434:3-435:22. Cline is a co-founder of Lancium. Tr. 435:23-25.

3. Lancium's Initial Vision. Lancium was formed in November 2017 (Tr. 436:12-14; 533:4-5), with the initial vision to put flexible datacenters (*e.g.*, Bitcoin miners) next to wind farms (*i.e.*, co-locate) to take advantage of the highly variable power output of windfarms. Tr. 437:11-438:16; TX373; TX374 at 25182; Tr. 541:21-542:15; TX266 at 20054. When power prices were high, Lancium would ramp down to allow the wind farm to sell that power to the grid, but when power prices were low the flexible datacenters would ramp up. Tr. 438:10-439:16; TX374 at 25182; Tr. 533:22-534:16; TX372 at 25166; Tr. 539:9-540:21, 541:5-20; TX266 at 20049. This co-location was behind-the-meter and such that Lancium would agree

to curtail based on real-time signals so the windfarm could capture high-priced hours. Tr. 546:13-22. In 2018 and 2019, Lancium performed analyses of how much "uplift" (*e.g.*, how much more value) windfarms would receive under Lancium's proposal, Tr. 546:17-547:2, 551:24-552:17; TX176, including for Glidepath in 2018. Tr. 547:15-548:1; TX478; Tr. 548:10-549:17; TX233; TX234 at 18300; TX795.

4. <u>Lancium's Technology And The Conception Of The '433 Patent.</u> From the beginning, Lancium focused on protecting its inventions. TX374 at 25182; Tr. 536:14-537:12; TX778 at 20042. One of its early patent applications was WO 2019/139632 ("the '632 application"), which named both McNamara and Cline as inventors and has a priority date of January 2018. TX163 at Cover.[1] Figure 6 depicts the flexible data center (200) connected to the wind farm, as well as connections to the local power substation (690) and the grid (660). Tr. 441:13-442:7; TX163 at Fig. 6; *see also* ¶¶53-54. Figure 2 shows the individual computing systems (100) of the flexible datacenter organized into racks and subsets (240), as well as a datacenter control system (220), which may be a computing system configured to "dynamically modulate power delivery to one or more computing systems (100)." Tr. 442:8-443:8; TX163 at Fig. 2, ¶¶22, 30, 33, 38. Lancium would have an agreement with the wind farm stating the maximum amount of power Lancium could use, but if directed by an operational directive or via a determination based on monitored conditions,

[1] Lancium has other patent applications. Tr. 537:13-539:8; TX164-TX166; TX767.

including economic conditions, Lancium would control its computing systems on a granular level (i.e., control on the individual computing system or collections of computing system level) to ensure that its systems consumed less power. Tr. 444:16-445:19; TX163 at ¶¶22, 33. Lancium, therefore, monitored directives from the wind farm (and potentially the grid operator) indicating how much power Lancium could consume. Tr. 445:2-446:10; TX163 at ¶¶68, 90, Fig. 9. This monitoring included receiving information such as forecasts affecting the price of power and "economic considerations" such as the real-time price of power, the price of Bitcoin, and other information enabling Lancium to determine whether it was profitable to mine. Tr. 446:11-448:6; *see also* Tr. 542:16-544:5; TX594 at 33410. In sum, by Spring 2018, Lancium conceived of monitoring conditions, determining when a ramp-up condition was met based on economic, reliability, and/or operational conditions, setting a strategy based on a targeted power consumption, and instructing the computing systems to perform computational operations. Tr. 448:10-23; TX163 at Figs. 4, 9, ¶¶42, 44, 68-72.

5. By the Summer and Fall of 2018, Lancium was operating 120 miners at its Thomas Road R&D Facility ("Thomas Road") in Houston. Tr. 448:24-450:3-21; TX462, TX463 at 27993. To control the miners, Lancium modified off-the-shelf software from ServiceNow and Tier44. Tr. 451:9-452:9. The system at Thomas Road was monitoring information, including power and Bitcoin price, to determine

a performance strategy based on whether it was profitable to mine Bitcoin.[2] Tr. 467:24-468:4. Based on such information, including the network/global hashrate, Lancium calculated the "Breakeven Price" for different types of miners (*see* Tr. 469:13-470:11; TX222; TX223)—a well-known metric—and used that to determine when to turn different miners on or off. Tr. 470:12-471:1, 472:6-473:4, 477:18-20, 478:12-479:2 (referring to TX345 at 24902 (point 4)).[3] Lancium successfully demonstrated its live system (120 miners) for an investor (SBI Holdings) in September 2018. Tr. 459:16-461:14; TX189 at 15148-49; Tr. 464:14-465:4; TX176 at 14628-29; Tr. 465:5-466:13-468:4; TX179; TX180. Lancium also conceived of monitoring Locational Marginal Price, ERCOT parameters, and weather conditions (Tr. 471:2-472:5), and controlling its systems remotely from, for example, its Network Operating Center (NOC) (Tr. 463:24-464:13; TX176 at 14629) or via a mobile computing device at this time. TX163 at ¶¶29-30; TX189 at 15148-149.

6. Ultimately, Lancium decided to terminate its contract with Tier44 and develop its own software internally. Tr. 479:3-480:21; TX291; Tr. 477:18-478:11; TX345 at 24901 (point 1). By Spring 2019, Lancium used its internally-developed software as

[2] Lancium also became a market participant in ERCOT to enable Lancium to obtain data that could affect its decision-making (*e.g.*, power price data) more quickly. Tr. 544:6-545:7; TX711; TX712.

[3] Lancium was also looking at "configurable algorithms" to permit it to prioritize certain computing workloads over other workloads because a traditional computing client may be willing to pay more to have their jobs done faster. Tr. 452:10-453:13; TX199; TX200 at 16282; see also Tr. 453:19-454:19; TX165 at ¶53.

its primary platform for miner control. Tr. 481:12-482:16. Lancium investigated using API's to pull LMP data from ERCOT by April 2019. Tr. 480:22-481:11; TX501. And by May 1, 2019, Lancium's Soft Load Control was (i) monitoring signals from a wind farm, ERCOT, from the miners themselves (*e.g.*, actual power utilization), Bitcoin price, real-time power price, hashrate, and block height, (ii) using that information to determine a target power level, and then (iii) sending instructions to some or all of the miners to suspend or restart their hashing algorithms. Tr. 482:17-484:6; TX320 at 24330-32. The software was called the Lancium Brain and eventually became Lancium Smart Response. Tr. 484:7-17; TX320 at 24330-31. The software would receive the Load Limit Setpoint ("LLS") (*i.e.*, the maximum amount of power Lancium could use (a "maximum power threshold")) and then determine whether to use all, some, or none of that available power based on economic and other considerations. Tr. 484:18-487:7; TX320 at 24331-332. The software would also adjust to changes in the LLS within the compliance period as shown in Figure 4-1 of TX320 at 24333-34.

7. Through portions of 2018 and into 2019, Lancium worked with various companies in connection with designing and manufacturing a mining container. Tr. 454:20-455:17, TX371 at 25037; Tr. 455:18-456:24, 457:7-17; TX979). As of May 1, 2019, Lancium was considering purchasing 40 foot, 2MW boxes holding ~1428 miners that met applicable safety/security standards for a cost of around $230K from

JV Driver/Ready Engineering. Tr. 475:5-24; TX781 at 21534; Tr. 552:23-553:24.

8. Lancium's Expansion Into Grid-Connected Applications. Lancium's investigation into applying its technology to grid applications began by at least May 2, 2019 when, at lunch with Jamie McAvity and Justin Nolan, McNamara learned that participating in demand response programs could effectively discount the price of power from the grid. Tr. 556:22-558:13, 559:3-15; TX748. McNamara continued the discussion with McAvity on May 3, 2019 at the FCAT conference. Tr. 559:19-560:2. McAvity attended the dinner that evening. Tr. 113:10-114:12, 560:3-14. After additional discussions with McAvity (Tr. 569:3-10; TX748-750), discussions with Calpine (Lancium's Thomas Road electricity provider) (Tr. 570:5-21; TX626 at 33800), and an introduction to and exchange of materials with a consultant, Jay Young (Tr. 570:21-571:24 TX437, TX438 at 26309-311; Tr. 571:25-572:11; TX740; TX741), Lancium was introduced to MP2, which became Lancium's QSE when Lancium qualified as a LR. Tr. 572:11-573:18; TX496; TX497 at 30580.

9. On August 26, 2019, Lancium received an "award" under the LR ancillary service program (TX 982; *see also* TX981), which indicates the award in MW for a 24 hour period for ADK (ERCOT's resource designation for Thomas Road). Tr. 492:15-494:5; TX982. After this, Cline realized that the "award" was actually "an obligation on [Lancium's] part, that we consume that amount of power that ERCOT COULD curtail" (Tr. 494:17-496:14; TX526), which led him to understand and

appreciate that being grid connected and being obligated to consume the awarded power was "an entirely different concept of operation" than Lancium was previously doing. Tr. 496:8-25. Now there was a minimum amount of power than Lancium "had to consume" and ERCOT, not Lancium, had the option to dispatch (curtail) Lancium's power. Tr. 496:22-25. If Lancium were to do economic dispatch (self-curtailing for economic reasons), Lancium had to develop its strategy to ensure that at least the awarded amount of power (*e.g.*, the minimum power threshold) was used, regardless of profitability. Tr. 497:1-499:5; TX526; TX310; TX595. This appreciation and subsequent strategy development in late August/early September 2019 is the conception date for the "power option agreement," "power option data," and "minimum power threshold" related limitations of the '433 patent. Tr. 695:20-696:6. Cline and McNamara further refined these concepts over the next months (*see, e.g.*, TX298; Tr. 499:6-20), and also realized that Lancium's software was so sophisticated that Lancium could qualify as a CLR, which it did thus becoming the first load-only CLR within ERCOT. Tr. 499:21-501:3. Lancium filed the patent application on October 28, 2019 (TX167) that ultimately issued as the '433 patent naming McNamara and Cline as inventors. Tr. 501:4-15; TX1.

10. Power-Sell Back. In August 2019, Calpine responded to an inquiry from Lancium regarding a fixed price agreement (Lancium had always used month-to-month index pricing) given "how close we are to all time historical lows." Tr.

573:21-574:21; TX758; TX122. Calpine performed a "look back" analysis indicating Lancium could reduce its power price by $10 per MWh. Tr. 574:13-575:4; TX763; TX764; *see also* Tr. 575:12-25. On August 14, 2019, Lancium entered into a fixed price addendum with Calpine. Tr. 576:1-3; TX756; TX757. Section 4.2.2 of the 2019 addendum contained a standard, non-negotiated sell-back provision. Tr. 576:8-17; TX757. This same provision was contained in section 4.3.2 of the 2018 addendum (Tr. 576:18-577:6; TX122 at 35638), which Lancium had not appreciated because then it had not pre-purchased power and thus could not sell it back. Tr. 577:7-13. The change to a fixed price agreement with Calpine and the standard contract language was how Lancium learned of sell-back, not from Storms (Tr. 566:20-25, 577:10-15, 578:2-5, 578:23-579:5), as is reflected in McNamara's email (TX567 "This is cool…") and spreadsheet TX568. Lancium also updated a slide deck to reflect sell-back as "Power Arbitrage." Tr. 578:13-579:3; TX471 at 30066.

11. McNamara and Cline conceived the '433 patent's inventions without using any information provided by Storms. Tr. 501:16-25, 580:1-11, 690:20-691:3.

II. STORMS IS NOT AN INVENTOR OF THE '433 PATENT

12. BearBox was founded by Austin Storms in late 2018 (Tr. 106:22-107:2; TX899) and only ever sold one of the BearBox containers—at a loss. Tr. 132:7-11. Today, BearBox makes no products, has one employee (Storms), and has no assets. Tr. 110:1-7. Storms has a B.S. degree with a focus on geography. Tr. 110:10-12.

I. Introduction

Storms conceived of and developed a software-based system that would give a windfarm operator (a type of "power entity" according to the '433 Patent) the option of selling power to a Bitcoin miner or selling power to the grid. Using this software, the windfarm operator would supply electricity to the Bitcoin miner when it made economic sense to do so, but would have the option to divert electricity from the miner to sell at the "locational marginal price" on the electricity grid. This system, illustrated in the annotated diagram displayed throughout trial, is what Lancium claimed in the '433 Patent.

McNamara and Cline's purported independent conception—which they concede came months after Storms' disclosures—is evidence only of their efforts to commercialize one embodiment of Storms' inventions in the context of ERCOT ancillary services. The inventions claimed in the patent are broader, and McNamara and Cline could not "independently" conceive of those inventions after Storms communicated those inventions to them.

The '433 Patent claims say nothing about ancillary services, grid stabilization, or demand response. Lancium is, therefore, wrong to suggest that the system that Storms conceived and communicated to McNamara and Cline is something different than what is claimed in the patent. Lancium's use of the terms "power option agreement" and "minimum power threshold" in the patent claims are just words Lancium chose to describe an unremarkable, decades-old contractual arrangement between a load and a power entity. "Minimum power thresholds" are the logical consequence of this arrangement; a load must use the power it contracts to purchase, subject to curtailment by the power entity. If the power is not being used, there is no option because there is no curtailment. These are known, conventional elements falling within the scope of the system Storms communicated to McNamara and Cline. Lancium's efforts to implement commercial uses of the claimed inventions is not evidence of conception. It is evidence of

power threshold, it's the amount of power that load must use during the time interval. That's what the structure of Claim 1 and the other claims is setting up; that in order to operate in accordance with the claim, the structure of the transaction is the minimum power threshold is the amount of power that the load must use during an associated time interval.

It's not enough to just purchase it, it's not enough that it's delivered because it could be sold back. And that's what BearBox's argument is, well, selling it back, not using it somehow it counts, and it doesn't. The claim is clear. And we ask that the Court adopt our constructions.

And we think the issue -- if our constructions are adopted, we think it is dispositive on summary judgment. Because Dr. McClellan was asked -- and this is in the briefing -- did BearBox's system consider this kind of scenario? And he said no. It's an nonsensical scenario. BearBox's system looks at this from the point of view of the Bitcoin miner. And is it more profitable for me than a Bitcoin miner to sell my power back to the grid or -- or to the wind farm or to mine Bitcoin. The option to the extent there even is one is with the Bitcoin mine in his system. He has never thought of any of this. Whereas it's clear from the patent that the option is with the power entity,

**IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE**

BEARBOX LLC and AUSTIN STORMS,

Plaintiffs,

v.

LANCIUM LLC,
MICHAEL T. MCNAMARA, and
RAYMOND E. CLINE, JR.,

Defendants.

C.A. No. 21-534-GBW-CJB

NOTICE OF APPEAL BY ALL PLAINTIFFS

BearBox LLC and Austin Storms, the Plaintiffs and Counterclaim Defendants in the above-captioned case, hereby give notice that they appeal to the United States Court of Appeals for the Federal Circuit from the Final Judgment (D.I. 267) entered in this action on April 5, 2023, which denied correction of inventorship of U.S. Patent No. 10,608,433 (the "'433 patent"), dismissed Plaintiffs' conversion count, and entered judgment granting and denying other relief as set forth therein, and from any and all orders, rulings, findings, or conclusions underlying that Final Judgment and adverse to Plaintiffs in whole or in part.

Included herewith is payment of $505.00 for the filing fee ($5.00) and the docketing fee ($500.00) as required by 28 U.S.C. § 1917, Federal Circuit Rule 52(a)(2), and Fed. R. App. P. 3(e), and the United States District Court for the District of Delaware fee schedule (effective September 1, 2020).

ASHBY & GEDDES

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Dated: May 4, 2023

IN THE UNITED STATES DISTRICT COURT

IN AND FOR THE DISTRICT OF DELAWARE

BEARBOX LLC and AUSTIN STORMS,	)	
Plaintiffs,	)	
v.	)	
	)	C.A. No.
LANCIUM LLC, MICHAEL T.	)	21-534-MN-CJB
MCNAMARA, and RAYMOND E. CLINE,	)	
JR.	)	
Defendants.	)	

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Wilmington, Delaware
Tuesday, December 6, 2022
Trial Transcript
VOLUME I

- - - -

BEFORE: HONORABLE GREGORY B. WILLIAMS
UNITED STATES DISTRICT COURT JUDGE

- - - -

Michele L. Rolfe, RPR, CRR

objections we provided last night were consistent with the parties' agreement on the timing of providing objections to slides. Counsel provided their slides for Dr. McClellan on Sunday evening, we provided our objections to those slides yesterday.

Our concern is that the slides, in our opinion, clearly demonstrate that plaintiffs intend to elicit testimony from Dr. McClellan that clearly violates Your Honor's rulings on our motion to strike his supplemental report, which Your Honor granted in our motion in limine to exclude his -- any opinions inconsistent with the Court's claim construction.

And, Your Honor, if you'd like, I have copies of the slides that we can show you, but they have slides expressly with Your Honor's claim construction.

Your Honor, in our opinion Dr. McClellan shouldn't be talking about Your Honor's claim construction, that was expressly the issue in his supplemental report that he was attempting to explain how his opinions were consistent -- excuse me -- with your claim construction ruling. And so any opinions where he is discussing the Court's claim construction, in our opinion, were already excluded by your ruling on the motion to strike, Your Honor.

And several of their slides discussing claim elements expressly, in our opinion, include information that

is from his supplemental report and not in his original reports. And so our concern is that when counsel gets -- when Mr. -- Dr. McClellan gets on the stand, all of his testimony that will be relating to the claim elements that include the terms that Your Honor construed is improper.

Your Honor already found in your ruling granting our motion to strike that Dr. McClellan's two opening reports -- and this is a quote from Your Honor's ruling, that "neither of Dr. McClellan's opening report, nor his reply report, explain how BearBox's system operated by maintaining, 'a minimum amount of power a load must use during an associated time interval,'" which was Your Honor's construction of the term "minimum power threshold."

So any testimony that he offers attempting to explain how Mr. Storms' -- the system disclosed or falls within that Court's claim construction, which is the majority of the testimony that is demonstrated by his slides, in our opinion, Your Honor, is in violation of the Court's claim construction.

Your Honor also found that Dr. McClellan was previously of the opinion that the load, not the power entity, held the option in a Power Option Agreement, which was contrary to Your Honor's construction of a Power Option Agreement.

And so any testimony that Dr. McClellan offers

relating to any claim term that includes or depends from the elements with a Power Option Agreement are -- were either stricken by Your Honor's ruling on our motion to strike or are inconsistent with Your Honor's claim construction ruling, as you already found.

MR. HORTON: Your Honor, I disagree with that characterization. And, you know, I think the -- Your Honor's ruling on motion in limine one from the defendants, you know, we thought that was clear. It was granted to the extent that Dr. McClellan cannot offer an opinion inconsistent with the Court's claim construction order.

That necessarily means that Dr. McClellan needs to consider the Court's claim construction order to determine whether his opinion is consistent or inconsistent with it. So we don't think that that's -- you can't ignore the claim construction order. And it's -- he's really just speaking to it to the extent he's saying his opinions are consistent with it.

And we understood Your Honor's ruling on motion in limine one to state that as object -- if there are objections to Dr. McClellan's testimony, as it's being elicited, that defense counsel is free to raise those objections.

And if are sound bites that they contend are inconsistent, which is -- you know, we think that that's

what they're doing, they picked sound bites out of the deposition. They are trying to sort of make that representative of Dr. McClellan's opinions as a whole, we don't think that's proper or correct.

But if they think that there's inconsistent statements from his deposition, they are free to cross-examine him on those statements.

THE COURT: Okay. So we're clear that his supplemental report was stricken.

MR. HORTON: Correct.

THE COURT: And that he can't testify inconsistent with the Court's claim construction.

MR. HORTON: Correct.

THE COURT: Is Dr. McClellan going to be the first witness that you introduce?

MR. HORTON: No, Your Honor.

THE COURT: Okay. So what I want to do is see copies of the slides, I'll take a look at them before we put him on the stand. And I'd like a proffer from plaintiff as to what Dr. McClellan's testimony will be so that I can take a look at my past opinions and see whether it's something that we need to deal with ahead of time or whether we can deal with as the testimony is being given by through objection.

MR. HORTON: Yes, Your Honor.

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didn't have to. What's important is the substance of his invention.

The critical question is who conceived, as that term is used in patent law, the subject matter of the claims at issue, not the explicit words used.

Dr. McClellan will help us map Mr. Storms' words and Mr. Storms will help us map his words and concepts that Lancium chose for the patent.

Proud of his work with the BearBox system in hand, in May 2019 Mr. Storms traveled to a cryptocurrency conference in Boston hoping to find a customer or partner for his technology. It was there on May 3, 2019, that he met Mr. McNamara, CEO of Lancium and John Cohen, CFO of Lancium.

Storms, McNamara, Cohen sat together as part of a larger group, all conference attendees. Storms and the Lancium executives discussed business and their technologies, Mr. Storms detailing his new system. Mr. Storms will give the court his firsthand account.

And while Mr. Storms memory of the dinner is important, it must be corroborated.

To establish sufficient collaboration, the inventors -- I'm sorry. Although not every factual issue needs to corroborated, here it is: Following dinner, McNamara and Storms exchanged phone numbers. Continuing the

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line of communication and text messages between the two followed.

Mr. McNamara tells Storms that his BearBox may have benefits and says that Lancium and Storms have lots to collaborate on. Storms says he'll send documentation on his system, including specs on the boxes, power distribution units, logic design.

Having not received the BearBox specs yet, three days later, McNamara is impatient and asks Storms again to send me those box design specs, please.

For joint inventorship, even if the Court determines that Mr. McNamara, Dr. Cline made some contribution to Mr. Storms' invention that was not just some known conventional element. There is a collaboration requirement that is met if there's an open line of communication.

The co-inventors need not work physically together or at the same time nor must each inventor contribute equally. All that's required is some quantum of collaboration or connection.

That next day Mr. Storms' e-mails to Mr. McNamara, his diagram specification sheet and data file. Three minutes after receiving it, Mr. McNamara forwarded Mr. Storms' documents. He forwarded the documentation to Jon Cohen, Lancium's CFO, Eric Kutsha, Lancium's head of

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engineering, and Dr. Raymond Cline, Lancium's Chief Computing Officer and named coinventor with Mr. McNamara on the '433 patent.

From the defendants, we expect to hear a few things during this trial. We expect to hear that Mr. Storms is not an inventor because his system was never connected to an actual grid and the simulation never had an actual relationship with a power entity.

But the law does not require a commercial use of an invention for conception. Not even close. An inventor need not know that his invention would work for conception to be complete, but rather need only show that he had the idea.

The discovery that an invention actually works is part of its reduction to practice.

We also expect to hear that everything Mr. Storms might have disclosed to Lancium, Lancium already knew. We intend to introduce evidence of Lancium's business model and behavior before meeting Mr. Storms and right after.

The Court should consider under the rule of reason all pertinent evidence. And not just what Lancium says here at trial, but Lancium's activities before and after meeting Mr. Storms and what they said about this technology contemporaneously and behind closed doors.

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We've prepared a timeline to illustrate this important pertinent evidence. On the left in blue illustrates Mr. Storms' development of technology from late 2018 through April 2019, his conception and reduction of practice.

In red just below illustrates during that same time period, Lancium's business model and technology was focused on turning its Bitcoin miners off when power was expensive. Lancium will spin down during periods of high-price power.

This is exactly what GlidePath and Mr. Hakes originally proposed to Mr. Storms. Then on May 3rd, Mr. Storms and Mr. McNamara met, had dinner. Mr. Storms explains it all. Storms and McNamara exchanged texts and on May 8th Mr. McNamara impatiently reminds Storms he's still waiting.

Storms, can you send me those box design specs, please.

On May 9th, Mr. Storms sends them. On May 10th, the very next day, things started to change for Lancium. Mr. Storms' dinner companions, Mr. Cohen and Mr. McNamara, e-mail Calpine, Lancium's qualified scheduling entity or electricity broker, asking for information on ERCOT's ERS or emergency response service, which is a demand response program, something that allows a load to make money when

what's called ASIC. It's an Application-Specific Integrated Circuit. They only do one thing. They only perform one task and that's what makes them a little bit special.

So those computers, they look like aluminum shoeboxes and they produce a ton of heat. They use a lot of energy. And so the facility just housed those computers.

Q. So was that mining facility that you built at the karate studio successful?

A. No, it was not.

Q. And why not?

A. Just shortly after the time that the facility was energized, you know, roughly three or four months, the cryptocurrency markets collapsed relatively in price. And I was paying more for power than -- than I was generating in revenue at the time.

Q. All right. So what did that experience prompt you to do?

A. I started looking for cheap energy sources to -- to house the machines and understand that in order to take advantage of those cheep energy sources, I was going to have to build a miner container, if you will, a mobile unit.

Q. Okay. So what timeframe are we in now?

A. This is Q2 or Q3 of 2018.

Q. Is this about the time you started to call your company BearBox?

A. I think so. Yeah, I think I -- I think I registered the entity BearBox LLC in late 2018.

Q. And where did you get the name BearBox?

A. So it's kind of an interesting backstory. At the time, the other manufacturers of -- of these units or these type of units, they were -- they looked like chicken shacks. And I knew, being mobile, that these things had to be secure, they had to be able to withstand any type of intrusion. And so I -- I built them to kind of withstand a bear attack, if you will.

At the same time, I built them during a bear market, so I figured BearBox was a -- was a good choice for the name.

Q. All right. So at this point in 2018, you were developing a shipping container or a BearBox for Bitcoin mining. Where did you contemplate deploying these shipping containers for mining?

A. I contemplated deploying them at renewable generation facilities or very nearby. I think that was the cheapest energy that was available at the time.

Q. How would the miners in the box be controlled if they were deployed remotely?

A. They would have to be able to be controlled remotely as well.

Q. Let's take a look TX128. Mr. Storms, are you

familiar with this picture?

A. Yes, I am.

Q. And what is this a picture of?

A. This is a picture of -- on the floor, a Bitcoin miner and a power supply in my apartment that I was running tests on. On the stool is a small device, it's a solid-state -- solid-state relay. And then additionally on the stool there's a blue device, that's Ethernet controlled that sends a signal to that solid-state relay.

Q. And what date was this picture?

A. I'd have to flip to it in the binder. This is November 29, 2018.

Q. Let's take a look, then, at TX130. And are you familiar with this picture at TX130?

A. I am, yes.

Q. And what is this?

A. This is similar to the last picture we looked at, it's a -- it's a Bitcoin miner, a computer with a power supply on the left-hand side. And then there's a small black device in between the power supply and the green device, that's an AC -- it's a Zephyr relay, it's a Form C relay. And then there's a green 32-channel relay controller that's connected to the network as well.

Q. And where did you take this picture?

A. This picture is on the workbench upstairs at Goldstar

Electric's office.

Q. And what is Goldstar Electric?

A. Goldstar Electric is an electrical contracting company.

Q. And who owned Goldstar Electric or who owns it?

A. Jason Hustler owns Goldstar Electric.

Q. Who is Mr. Hustler?

A. Jason is a friend of mine who I've known for a very long time. He does -- he owned his own electrical contracting company and did some work for us in the past.

Q. Do you happen to remember the date of this picture?

A. I -- I do. January 7, 2019. It was my birthday.

Q. Okay. Let's take a look at TX129.

Are you familiar with this image?

A. I am, yes.

Q. And what is this?

A. This is a graphical user interface of the first -- the first Ethernet-controlled relay controller that I used. I wrote this.

Q. And what would you do with this graphical user interface?

A. It allows you to control individual relays on the relay controller to turn miners on and off remotely.

Q. And what date was this?

A. This is December 2, 2018.

Q. Let's take a look at TX132.
Are you familiar with this image?
A. I am, yes.
Q. And what is this?
A. This is another graphic user interface, but this one is for the BearBox management console.
Q. And what's depicted here?
A. What's depicted here is four separate power distribution units, configured within a mining container and a fan control module for eight fans in the bottom left-hand corner, as well as the IP and port configuration for each device.
Q. And what is a power distribution unit?
A. A power distribution unit is -- the easiest way to think about it is it's like a -- like a power strip on steroids. So it's a -- it's a unit that specifically delivers power to downstream computing devices but in a much higher density than normal distribution methods.
Q. Okay. And when was this, TX132?
A. This was January 24, 2019.
Q. Okay. Let's take a look then at TX131. This looks similar.
Are you familiar with this?
A. I am, yes.
Q. And what is in TX131?

A. This is the same BearBox management console graphical user interface, with just two relays that are in the off position.
Q. Let's take a look at TX134. And what is -- are you familiar -- let me say that again.
Are you familiar with this picture, Mr. Storms, at TX134?
A. I am, yes.
Q. And what is shown here?
A. This is -- this is the power distribution unit that I was just talking about a second ago.
Q. This is an example of a power distribution unit; is that right?
A. It is, yes.
Q. And what date was this?
A. This is March 2, 2019.
Q. Okay. Let's take a look at TX138.
And are you familiar with this picture?
A. I am, yes.
Q. And what is this?
A. This is a close-up picture of the 32-channel relay controller, the green device that's on network, and the AC or alternating current relay that controls the miner downstream.
Q. And when was this?

A. This was March 14, 2019.
Q. And where was that picture taken?
A. This picture was -- this picture was taken in my apartment in New Orleans.
Q. Let's look at TX051. And this looks like a BearBox brochure.
Are you familiar with this document?
A. I am, yes.
Q. And what is this?
A. This is a draft form of a -- what I would consider to be, like, an investment memo or investor deck.
Q. And when were you using this brochure?
A. The -- the date is March 16, 2019.
Q. So by April of 2019, Mr. Storms, what were you doing with the development of your BearBox?
A. By April 2019, I was writing software for the automatic -- automatic miner management system.
Q. And what is the BearBox automatic miner management system?
A. It's a fully encompassing system that takes into account the machines that are on the network, the power distribution units located inside of the build, the operating parameters of the -- the Bitcoin network, there's a lot that goes into it.
Q. Let's take a look at TX139. Are you familiar with

this picture?
A. I -- I am, yes.
Q. And what is this a picture of?
A. This is a picture of some of the -- some of the code that I sketched out on my white board for various functions within the BearBox management system.
Q. And where was this?
A. This picture was located -- taken on a white board in my apartment in New Orleans.
Q. What is referred to at the top as cgminer_API_test?
A. Yeah, cgminer_API_test is referring to a Python function that does various things on the network.
Q. When you say "a function," you mean -- is that some computer code?
A. Oh, yeah, sorry. Python -- Python is a computer development language. And a function within Python is a collection of code that runs when the function is -- is called from the main script.
Q. And is that a function that you wrote?
A. It is, yes.
Q. And just kind of overall, what are you describing on this white board?
A. What I'm describing here is the ability to make a -- make a call programmatically to the cgminer instance that runs within the miners' firmware to send a command LCD that

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receives a summary of operating parameters from each individual device on the network.

And requests -- requests_slush/dp function is a separate function that makes a request to Slush Pool, which is a Bitcoin mining pool, to reconcile the data between what's being returned from the cgminer_API_test function to the slush function as well.

Q. And when was this?

A. This is April 3, 2019, okay.

Q. Just going back to TX134 for a moment -- I'm sorry TX, 131. You testified earlier this was a graphical user interface.

Was this something that you made?

A. Yes, I did.

Q. And let's take a look at TX138. Was this a setup that you had in your apartment with a relay; is that also something that you made?

A. It is, yes.

Q. Okay. Let's take a look now at TX141.

Are you familiar with TX141?

A. I am, yes.

Q. And this looks like a spreadsheet?

A. Yes, this is a -- this is a comma-separated value or CSV export of a database table, it is.

Q. Does it relate to the information that we saw in the white board a moment ago?

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A. It does, yes. So in the BearBox builds, this information corresponds back to that white board drawing.

Q. And just generally what information is it that's reflected here?

A. The information reflected here is -- it's a software to hardware mapping of individual machines and their naming schema. So, for example, on row one where ID1 is, the miner name column represents the -- the miner name as it's reported in Slush Pool.

And then the -- the naming schema is the site location, Mandville -- or I'm sorry, the cite name, Mandville, the site location, a direct shelf position. And then there's a corresponding power distribution unit -- PDU and relay to that machine as well.

Additionally, there's -- there's some columns about restarting the machine, IO rebooting the machine or powering the machine off or back on. And then maintenance lags.

Q. Thank you. Let's take a look at TX140. We have another white board.

What is this white board?

A. This is also a white board picture that was taken in my apartment in New Orleans, and it references a similar function as earlier, where across the range of IP addresses,

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the check status function passes in the host address argument, which is the IP address of the machine, and returns -- returns some values for those machines.

Q. Are those your notes?

A. These are my notes, yes.

Q. And the notes we saw on the previous white board, are those also your notes?

A. They are, yes.

Q. When is the notes on TX140, this picture?

A. This is from April 3, 2019.

Q. Okay. We can move off of that exhibit for now.

Are you familiar with someone named Ben Hakes?

A. I am, yes.

Q. We heard a little bit about Mr. Hakes in the opening statements, how did you meet Mr. Hakes?

A. Ben sent me a Twitter message in late 2018.

Q. And why was he sending you a Twitter message.

A. He sent me a Twitter message. He saw what I was doing in Bear and he liked it, and he had an opportunity or so he thought for cheap power through a contact that he had.

Q. Let's take a look at TX015.

Do you recognize this e-mail chain?

A. Yes, I do.

Q. Let's take a look at the bottom of the page, this is TX15.4.

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Is this the first communication you received from Mr. Hakes?

A. It is, yes.

Q. Just to clarify, you mentioned you first heard from him on Twitter; is that right?

A. Yeah, I heard from him on Twitter, but this message looks a lot like the Twitter message.

Q. Okay. What did you understand from his first message to you here?

A. That he had a potential opportunity for a 20 to 30 megawatts or maybe more of renewable power at a remarkably cheap price of $3 per megawatt, which I think was a typo at the time.

Q. All right. What did you think he meant by that?

A. I think he meant $30 per megawatt hour. As those conversations progressed $3 per megawatt isn't exactly how you price power.

Q. Okay. So even if he meant $30 per megawatt hour, was that something of interest to you?

A. It was, yeah. $30 per megawatt is less than 50 percent what I was paying for the facility in Mandville, that wasn't economical.

Q. Did you learn who was behind of Mr. Hakes?

A. Yes.

Q. And who was that?

A. It was a company called GlidePath.
Q. Who is GlidePath?
A. GlidePath is a wind asset and battery asset generated developer for a company out of Chicago, I can't remember their name.
Q. Is GlidePath a Bitcoin mining company?
A. They are not, no. GlidePath is an energy generation and storage company.
Q. Let's take a look now at TX14 -- 014. This looks like a text message thread.
Are you familiar with this text message threat?
A. I am, yes.
Q. And what is it?
A. This is a text message thread between me and Mr. Hakes.
Q. And when does it begin?
A. The first text message is from December 5, 2018.
Q. All right. Well, let's go ahead to March of 2019. If we could look at TX14.12.
On TX14.12 there's a text on March 7, 2019 at 10:02 a.m. where Mr. Hakes says: They are not sure that $.02 is a dog that will hunt. They haven't told me an exact number, but it seems more like upper $.02 to $.03 is more realistic.
First of all, who is he referring to as "they?"

A. He's referring to GlidePath.
Q. What did you understand that he was saying here?
A. I understood that he was saying that $0.02 and selling higher of $0.02 doesn't work for them for whatever reason, he just called it a dog that won't hunt. And realistically they wanted to charge upper $0.02 to $0.03.
Q. All right. Let's turn now to TX14.1. And calling your attention to April 5, 2019, 8:14 a.m. message.
Mr. Hakes says: It'll be super cool to write a little Python script that ran on the UPS at the mining site that looked at the LMP, locational marketing price, pricing at the wind farm feed and power on/off based on whether or not the LMP is above or below, so $0.03 per kilowatt hour.
What was your understandings about what Mr. Hakes was suggesting to you?
A. Ben was suggesting that it would be cool to write a Python script that turned the miners on or off based on $0.03 data extract price.
Q. So just to unpack a little bit of that, what do you mean by a Python script?
A. Again, Python is a -- it's a development language in computer science. And Ben was suggesting that you could run a Python script at the site that would turn the miners on or off based on whether the LMP is above or below $0.03 per kilowatt hour.

Q. And you referred to that as a static price, what did you mean by that?
A. It doesn't change; there's no calculation dynamically to adjust that strike price.
Q. Let's turn ahead to TX13.25.
And looking at the April 11th, 20119 text messages from you at both 12:11 p.m. and 12:19 p.m., generally what were you describing to Mr. Hakes here?
A. So I wanted to talk to him about the LMP check, because I thought that there was a way that I figured out to probability of mining with the LMP logic over a week or so versus just selling power at the LMP.
So you could dynamically compare the two and that realistically the model that I was working on at the time would use the onsite mining data and Bitcoin price API data to calculate that profitability threshold or that LMP number.
Q. Let's slow down and unpack that a little.
First it says: Let's talk some about the LMP check when you get a chance. I think I can model profitability of mining with LMP logic over a week or so versus just selling at LMP.
First of all, this has come up, but let's be clear, what does LMP refer to, as you understand?
A. Oh, yeah, so the LMP is the locational marginal

pricing that a generator receives for selling power at that pricing mode on the grid.
Q. Would it be fair to call that a shorthand for price?
A. Power price, yup.
Q. And what were you telling Mr. Hakes here?
A. I was telling Ben that I thought I could model profitability of mining with the LMP logic that we previously discussed over the next week or so versus just selling it at the LMP.
Q. So then referring to your next message, it says: And realistically, the model will use on-site mining data with price API data.
So just stop right there, Mr. Storms, what were you referring to here as "price API data?"
A. Price API data is the Bitcoin price in U.S. dollars API, that's offered by several Bitcoin exchanges, Coinbase, Kraken, it's the way to fetch the current Real-Time price of Bitcoin in U.S. dollars.
Q. Let's just slow that down a little bit. It says "a way to fetch the information," I want to understand why you refer to it with the term "API data?"
A. API is an application programmable interface that allows you to make programatic calls from computer code to another piece of computer code to return data.
And so a price API data in this sense was the

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Bitcoin price in U.S. dollars from an exchange.
Q. You then say: To dynamically calculate at what LMP selling the power back to the grid is more profitable than mining.
What did you mean by that?
A. Yeah, so, it was a way to -- instead of having a static strike price, there was a way to dynamically calculate a dollar kilowatt or dollar per megawatt hour locational marginal pricing and it is greater than the profitability of mining Bitcoin at that point on the grid.
Q. You then say that's the real arb; what did you mean by that?
A. That's the real arbitrage opportunity.
Q. And as you were using the term here, what did you mean by arbitrage?
A. So what I was thinking, you know, arbitrage in itself is just -- it is buying low and selling high. It's arbitraging a difference between the different markets.
In this scenario, it would allow units of electricity to be sold at the most opportunistic price. This would be the arbitrage, that is the units of electricity priced in the Bitcoin that they would mine in dollars versus being able to sell that back to the grid in dollars.
Q. Why did you think that was the real arb?

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A. Because I thought it added, I thought it added an interesting dynamic to renewable generation developer who could in real-time decide what the best, most economic use of their energy was.
Q. When you said "selling power back to the grid," at that time who were you contemplating selling power to the grid?
A. It would have to be the generator, because the generator is the one that owns the power to be sold back to the grid and the deal that I was contemplating.
Q. And what deal were you contemplating at that time?
A. A deal with GlidePath.
Q. If we turn ahead to TX14.26 through 27, there's a message you sent on April 19th at 8:04 p.m. with an annotated diagram on page -- let's blow that up.
Is this a message that you sent to Mr. Hakes?
A. It is, yes.
Q. And what is the -- and is this a diagram that you prepared?
A. It is; I drew this annotated diagram.
Q. What is this box at the bottom of the graphic?
A. That box is a shipping container, that's meant to represent one of BearBox units.
Q. Looking above that it says "power generation," what is the power generation?

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A. Contemplated here the power generation source is the wind farm or the wind turbines.
Q. And what is the lightening bolt?
A. The lighting bolt is representative of electricity.
Q. What is the pipe you illustrate here?
A. The pipe is representing the potential paths for electricity.
Q. Okay. And the pipe has a branch on it that leads to a cloud that says Real-Time LMP option.
What did you mean by that?
A. The branch to the Real-Time LMP option is exactly that, it's an option.
So like we previously discussed, it's a way for the renewable developer to generate more revenue by exercising the option to not deliver power to the mining container and sell it back to the grid instead.
Q. In the scenario depicted here, who would have the option to sell electricity at the Real-Time LMP price?
A. It would be the power generation source because they owned the electricity.
Q. And then what is depicted by the rest of the pipe going to that container?
A. The rest of the pipe going to the container is another potential path for the electricity to travel to serve the load or the computers that are running inside of

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that container to mine Bitcoin.
Q. I think further down on that same page on April 20, 2019, at 1:31 p.m., you then say: Gonna e-mail that to them with the data modeling once I figure that out.
Who is the "them" that you were referring to here?
A. That was GlidePath.
Q. And what did you mean when you said once you figured it out?
A. Once I figured out how to export it from the database table into what I thought would be a useful to them as a CSP or Microsoft service file.
Q. Let's turn to the next page, TX14.28.
And taking a look at your April 23rd message at 7:58 p.m., what is this?
A. This is -- it looks like a picture that I took from my phone of one of the database tables.
Q. We'll look at a better copy of that in a moment, but let me ask you some questions about these messages.
Why do you say it was one of the coolest things you ever put together?
A. Because it was at the time. It simulated a -- it simulated optimizing a renewable generation to generate the most amount of revenue from the units of electricity.
Q. Why did you say to Mr. Hakes "thanks for the idea?"

A. Ben was the one who kind of lead me down this path back on April 5th when he suggested looking at the LMP.
Q. Let's flip back to 14.25 for a moment.
Did Mr. Hakes give you the idea that you called the real arb in your message on April 11th?
A. No, he did not.
Q. And looking again at the annotated diagram on TX14.27, did Mr. Hakes give you the ideas behind the concepts reflected in the diagram?
A. No, he did not.
Q. Let's take a look now at TX143. Is this the screenshot that you texted to Mr. Hakes on that last message on April 23rd?
A. It appears to be, yes. I was trying to flip to it.
Q. And what information were you trying to convey to Mr. Hakes here?
A. This is -- this is in 5-minute increments. The -- I can't really tell from the column headers, but it looks like date, time, Bitcoin price, the network hashrate, the Real-Time LMP in dollars per megawatt hour, the Real-Time LMP in dollars per kilowatt, the gross profit you will received from -- and really it is a business with gross revenue you receive from mining Bitcoin, the power costs associated with that revenue, and during that profit during that same period.

Q. So each of these lines -- each of these lines represent different time intervals?
A. They do, yeah. So if you look at the day, timestamp, the code -- the code specifically runs every 300 seconds or every 5 minutes, it corresponds to 5-minute time intervals.
Q. What are you attempting to show in the different columns here?
A. So what I'm showing here is the -- the -- the every 5-minute time interval, what -- what would be mining versus what would be selling back power to the grid, if you were a generation asset owner.
And then in row 10, you can see there's a spike in the Real-Time pricing, it spikes from $34 per megawatt hour to $102 per megawatt hour. And during that time, your net profit -- if you're using that same power, the Bitcoin is negative. So, theoretically, the wind farm operator would want to sell that power back to the grid operator and curtail the mining operations.
Q. Let's turn to TX144. And what is shown here on this white board?
A. These are -- these are different Python functions with different arguments passed into them and methodology for determining a few things.
Q. And, again, are these your notes?
A. These are my notes, yes.

Q. And what was the date of this?
A. This was April 23, 2019.
Q. Going back to the actual white board, what -- just generally what were you outlining here?
A. Generally, I was outlining a few things; fetching or getting the Bitcoin price from -- from one of the APIs, this one was -- I was using Coinbase as an exchange that provided the price of Bitcoin. Getting the Bitcoin cash rate, there was a company that provided an API called chaindata so that would return the Bitcoin real-time data by requesting it and then running through certain logic in the simulation.
Q. Let's remind ourselves, what was the -- the date of this again?
A. April 23rd.
Q. Now let's -- let's turn to TX14.32. This is back to your text thread with Mr. Hakes. At 14.32 there's one April 23rd at 11:25 p.m. that says: I've been writing code for, like, 15 hours, though, and I'm going to sleep.
What code were you working on at that time?
A. I was working on the code that was represented in the white board drawing that we just saw.
Q. Now let's take a look at TX145.
And what is shown on this spreadsheet?
A. TX145 is a -- it looks like a CSE algorithm of a database table.

Q. Is this similar to the one we saw a few minutes ago?
A. It is, yes.
Q. And what are you -- is this something you prepared?
A. It is, yes.
Q. And when I say you prepared it, you used your software to prepare it?
A. I -- I wrote the code that generated the values in this database table.
Q. And what does this table show?
A. This table shows 5-minute intervals of the Bitcoin price; the network hashrate; the Real-Time Locational Marginal Pricing, and dollars per megawatt hour, same thing just converted to dollars per kilowatt hour.
Gross profit, which again, should be -- should be named gross revenue, the power cost associated with that interval as related to the power being used in that interval. And then the net profit of basically subtracting the gross profit from the power cost.
Q. And what's the date of this file?
A. This is April 24, 2019.
Q. All right. Let's take a look at TX150.
And is this a picture that you took?
A. It is, yes.
Q. And what are you showing here?
A. This is a Bitcoin miner just up -- I put it up on a

stool so I could vent out the heat that's generated by machine. It's connected to a power supply, the smaller aluminum box to the left-hand side of it. And that power supply is connected to an electrical circuit that corresponds to that small, that small set of relay that's on the other stool. And it's controlled by the relay controller, the green device on the other stool.
Q. So this is also in your apartment in New Orleans?
A. It was, yes.
Q. What -- what date was this?
A. This is April 29, 2019.
Q. All right. Let's go back to your texts with Mr. Hakes, let's look at TX14.41 and 0.42. Referring to a message from April 29th, 2019, at 10:21.
What were you sending to Mr. Hakes here?
A. This is a picture of the database table and the 5-minute intervals in which the -- the Real-Time LMP price spiked in the highlighted rows.
Q. And then in your accompanying message, you say Day-Ahead LMP then Real-Time LMP then break-even mining dollars per kilowatt hour; what did you mean by that?
A. Um --
Q. What were you -- let me ask you a different question perhaps.
What were you telling Mr. Hakes there?

A. I was -- I was telling Ben that the column headers, which are not included in this picture, the daytime one was -- is understood, but the first, second, and third column headers are the Day-Ahead LMP price for -- for that -- that interval, the Real-Time LMP price for that time interval, and then the break-even Bitcoin mining price in dollars per kilowatt hour for that time as well.
Q. Let's take a look at TX153.
Is this the same screenshot?
A. It is, yes.
Q. And what was significant about the rows that you highlighted?
A. What's significant about these rows is that during these 5-minute intervals, the price of power in the Real-Time market spiked tremendously to $0.32, $0.82, $0.47, $0.43, $0.62 and almost $0.67 in the Real-Time market. And because of that, the price for power corresponds to a greater amount than the break-even price of mining Bitcoin. During those periods, the miners would have been instructed to be off.
Q. And what date is associated with this screenshot?
A. April 29, 2019.
Q. Let's move away from that now. You mentioned that Mr. Hakes was contacting you in connection with a company called GlidePath.

Did you have any communications directly with people at GlidePath?
A. I did, yes.
Q. And what was the nature of those communications?
A. The nature of those communications were e-mail messages, some phone calls regarding putting together a business transaction.
Q. Let's take a look at TX146. And what is -- just generally what is this document?
A. This is an e-mail that I sent to Denis, Mike, Chris, and Ben.
Q. Okay. Well, who is Denis Labij?
A. Denis Labij is one of the power market guys at GlidePath.
Q. And referring to the header, what is the subject of this e-mail?
A. The subject of the e-mail is the day-ahead versus the RTBM, which is the Real-Time Balancing Market, LMP biz requirements, and data questions.
Q. And this is an e-mail then that you sent to the people at GlidePath; correct?
A. Correct, yes.
Q. Now first, you've been saying you've been working on some code for the miner management system. Why haven't you been telling the GlidePath employees about your miner

management system?
A. Because I was trying to conduct a transaction with them.
Q. And why were you sending them questions in this e-mail?
A. Because I didn't understand a few things about the market and figured that they would because it was something that they worked in every day.
Q. And did you receive a response?
A. I did, yes.
Q. Let's take a look at TX962.
Is this the response that you received from Denis Labij?
A. It is, yes.
Q. And we have a black and white representation here, but you understood that his comments were shown below in red or in black and white in this version; is that right?
A. Correct; they are bold in this version.
Q. So looking at really the third paragraph of your e-mail, what were you asking the GlidePath people in the third paragraph?
A. I was asking him for some of the business requirements around doing what I was trying to do specific to the ISO that they worked in.
Q. And what, if anything, did you learn from Mr. Labij's

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response?
A. Nothing in particular. He just -- he gave a long-winded answer to things that I was already working on.
Q. And did you respond to him?
A. I did, yes.
Q. Let's take a look at TX149. And what is this?
A. This is my response e-mail to Denis.
Q. And what did you say in this response?
A. I thanked him for his response and told him that it helped me tremendously in my understanding of how these markets worked, and that I was able to build a work around to the portal access issues and fetch both the day-ahead and the 5-minute data.
Q. And earlier when you were texting with Mr. Hakes you had said that you were planning to follow up with GlidePath. Is that one example of the type of follow-up with GlidePath?
A. It is, yes.
Q. Mr. Storms, did you write any computer code as part of your development of your miner management system?
A. I wrote every line.
Q. Let's take a look at TX20.
This looks like an e-mail, are you familiar with this e-mail?
A. I am, yes.
Q. And -- and what are the attachments to this e-mail?

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A. The attachments to this e-mail are different Python scripts that I wrote.
Q. And why are you sending these files to Jason at Goldstar?
A. I was sending these -- these files to Jason at Goldstar because the working prototype of the power distribution unit with the relay controller was -- was in his office and I wanted to test them there.
Q. And Jason at Goldstar, that's Mr. Hustler, right?
A. It is, yes.
Q. And the .py files that are reflected as attachments, those are the Python files; is that right?
A. That's correct, yes.
Q. Just to remind us, what does that refer to the type of file?
A. It's a file that contains computer code, Python is a software development language. And Python scripts are -- they are followed and they are named with a .py schema.
Q. And who wrote those Python files?
A. I wrote those Python files.
Q. Let's take a look at TX24.
What is TX24?
A. TX24 is an -- it's an example of the Python script I wrote.
Q. And was this part of the system that you were

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developing for miner management?
A. It was, yes.
Q. What was the date of this one?
A. The date here is May 1, 2019.
Q. Look at TX032.
What is TX032?
A. TX032 is a -- it's another source code file or Python file that I wrote.
Q. And was this part of the system that you were developing for miner management?
A. It was. And this one was the cgminer watchdog script.
Q. And what was the date of this one?
A. The date is May 7, 2019.
Q. Let's look at TX46.
What is TX46?
A. TX46 is a -- it's another Python file I wrote.
Q. And was also a system for miner management?
A. Yes, it is.
Q. And what is the date of this one?
A. May 6, 2019.
Q. Let's look at TX46.
What is TX46?
A. TX46 was another Python script that I wrote.
Q. And is this a script for miner management?

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A. Yes, it is.
Q. And what was the date of this one?
A. May 1, 2019.
Q. Let's look at TX48.
And what is this document?
A. TX48 is another source code file that I wrote.
Q. And was this also part of the system you were developing for miner management?
A. It was, yes.
Q. And let's look at TX49.
And what is TX49?
A. TX49 is, it's another Python script that I wrote.
Q. And was that also a part of the system you were developing for miner management?
A. Yes, it was.
Q. And what is the date of this one?
A. May 1, 2019.
Q. So let's take another look at your text messages with Mr. Hakes. I'd like to look at TX14.42. And the message that you sent on April 30th at 10:11 a.m.
There you said: Going to Boston this weekend for the mining summit at fidelity.
What was this summit?
A. This summit was -- it was put on -- it's an event put on by fidelity FCAT Labs. They invite industry players in

new and emerging industries and put on a one- or two-day conference for them.
Q. And why were you attending the summit?
A. I was attending the summit to, number one, figure out what everybody else was kind of working on; and then, number two, try to find a client or partner to work with me and collaborate with me on the BearBox stuff.
Q. And did you in fact attend the conference?
A. I did, yes.
Q. And how was the conference?
A. The conference was great.
Q. About how many people do you think attended the conference?
A. There was several hundred people there.
Q. And did you meet new people at the conference?
A. I did meet some new people there, yes.
Q. About how many people would you say you met there?
A. Maybe 10, 20 people.
Q. Do you recall meeting anyone in particular at the conference?
A. I do, yes.
Q. And who is that?
A. I met a hand full of people. James McAvity, Ray Valner, Rich Godwin, Michael McNamara, John Goodwin. I met Steve Barber for the first time in real life, even though we

had been friends for the first time. I met his fiancee. I met a lot of people at the conference.
Q. How did you meet Mr. McNamara?
A. I was introduced to him by James McAvity at the cocktail mixer after the event in Fidelity's lobby.
Q. And where was Mr. McNamara from?
A. I believe he told me he was from California.
Q. And what company was he with?
A. He worked, he worked for and was the CEO of Lancium.
Q. And do you understand that Mr. McNamara is one of the defendants in this case?
A. I do, yes.
Q. And what sort of event was it where you met Mr. McNamara at the conference?
A. I met Mr. McNamara at a cocktail mixer shortly following the last presentation.
Q. And what did you tell Mr. McNamara during the cocktail reception?
A. I told him some of the things that I was working on at BearBox. I told him kind of my general idea about renewable energy.
Q. I talked to him about the power distribution units that I was developing.
MR. NELSON: I'm going to object. This is all hearsay. I mean, he's repeating out of court statements as

if they are real and relying on them for the truth of the matter asserted.
THE COURT: Response?
MR. LABBE: Your Honor, we're not offering it -- we're offering it for the sake of notice to the defendants in term of what was communicated to the defendants.
MR. NELSON: It's classic hearsay. It's out of court statements that he's saying now he said to the defendants and they are relying on it for the truth of the matter asserted.
MR. LABBE: Well, I guess, Your Honor, I would make a couple of points about it. One, I don't think we're relying on it necessarily for the truth of the matter asserted, only that he had these conversations with Mr. McNamara and communicated information to him, not necessarily that his system actually worked or that any information that he communicated was true. It could have been that his systems didn't even work, it was just to relay the information that was communicated. And we certainly don't disagree that he has to have corroborating evidence about what was communicated, but this is just to set the stage for the communications that occurred in these meetings.
MR. NELSON: But the point of this is that he's relying that he in fact communicated this information, the

statements that Mr. Storms is making that he communicated those statements to McNamara, which they then are going to turn around and say is part of the basis of their claim that Mr. McNamara, Mr. Cline and Lancium misused that information and put it into a patent application. And so they are relying -- if they want to say the communication occurred, fine, but if they are getting to the substance of that communication, that is going to the truth of the matter asserted and the heart of their claims and it's hearsay.
MR. LABBE: Your Honor, to respond to what he just said, it's just that -- he is communicating what he told Mr. McNamara, but we're not relying on that to prove the truth of the matter asserted. We're only relying it on it to show that Mr. Storms had those communications. He can talk about what the communications were, we're not relying on the truths of that to prove that the system worked or to prove that -- yes, we are relying on that he had those conversations, but the fact he had a conversation is not relying on the truth of the matter asserted in these statements.
THE COURT: Well, I think that because your claim is relying on the specifics of the communication, it does fall within classic hearsay. I think you can have him testify that a communication occurred.
When you get into the details of that

communication, that's where you're sort of going awry of the rules of evidence.

MR. LABBE: Your Honor, I'll try to ask the questions in a way that -- I'll -- we'll move on from this particular question, Your Honor. And we're going to have some testimony about a dinner, but I'll try to ask the questions in a way that I don't think will raise the issue, but if it does...

THE COURT: Okay.

MR. LABBE: I'll trust that Mr. Nelson will object.

THE COURT: All right.

BY MR. LABBE:

Q. So, Mr. Storms, at the conclusion of this cocktail reception, what did you do then?

A. A large group of us walked to dinner.

Q. Okay. When you say a group of you walked to dinner, who was included in that group?

A. Myself, Michael McNamara, John Cohen, Quinn Lawler, James McAvity, Rich Godwin, Chris Bendickson, maybe a few others.

Q. And so who from Lancium was included in that group?

A. Michael McNamara, their CEO, and their CFO at the time, John Cohen.

Q. Okay. And where did you go to dinner?

A. We went to the Outlook restaurant, which is in the Envoy hotel.

Q. And do you remember the picture that Mr. Nelson put up during his opening, is that a picture of the restaurant that you went?

A. That is a picture of the restaurant, yes.

Q. And were you seated in the area that Mr. Nelson showed?

A. No, we were not.

Q. And do you have a picture that would help explain the room where you were seated?

A. I do not have a picture.

Q. Are you familiar with a picture of the room where you were seated?

A. I am, yes.

Q. Yeah, let's display PDX4.

And what is this a picture of?

A. This is the private dining room in the back, back corner of the Outlook restaurant. There's a single table, it's enclosed by glass.

Q. And is this the area where you had the dinner with Mr. McNamara and Mr. Cohen?

A. It is, yes.

Q. And where -- about where were you seated?

A. I could have taken this picture. I was seated at

that part of the table, not the head, but the seat adjacent to it on the left-hand side.

Q. And was anyone seated to your right at the head of the table?

A. Yes, John Cohen was.

Q. And what about across from you?

A. Michael McNamara was.

Q. And what about to your left?

A. To my left was Quinn Lawler.

Q. And what happened at the dinner?

A. At the dinner we talked and we ate and we drank.

Q. And were you able to communicate anything to Mr. McNamara and Mr. Cohen about the system that you were developing?

A. I was able to communicate.

Q. And how did they respond to that information?

A. They were interested in the information that I communicated to them.

Q. And did they ask you follow-up questions?

A. They did ask me follow-up questions.

Q. And what types of questions were they interested in?

A. They were interested in follow-up questions regarding the product specifications and details of my systems.

Q. And how did you leave things with them after the dinner?

A. Mr. McNamara and I exchanged numbers and said that we would be in touch.

Q. Who paid for the dinner?

A. I paid for some of it.

Q. When you say you "paid for some of it," you said there were a number of people at the dinner, did you split the dinner somehow?

A. I think we had to, there was a good amount of people there, and I don't think the amount that I paid could have covered the entirety of the party.

Q. Okay. Let's just take a look at TX158.

And what is reflected in TX158, it looks like a bunch of statements, bank statements?

A. Yes, TX158, it's a largely redacted bank statement from my bank account.

Q. Okay. And what types of things here are not redacted?

A. Yeah, what's not redacted is a -- it's a payment to Goldstar Electric on December 31st.

Q. No, not that specific thing, but just generally, what entries in these bank statements are not redacted?

A. Oh, these bank statements, they -- the nonredacted portions represent costs incurred to develop the BearBox technology.

Q. Okay. So refer to TX158.35.

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modeling data that I had been running.
Q. What was the recent modeling data that you also refer to in the e-mail?
A. That's the -- the modeling data or CSE export from a -- from the database table regarding one of the Exelon wind sites that I -- that I was modeling for at the time.
Q. So referring to the next page, 157.2, what is this?
A. This is the one page of the product details regarding the hardware and software components of the BearBox build.
Q. And what, if anything, does it show about the software you were using at that time?
A. It -- it shows that there was a software management layer that included a local cgminer watchdog postgreSQL, which is a type of database for login information about the miners, a PDU and relay mapping to accomplish full automation within the box. And there was an optional real-time break-even monitoring based on renewable marketplace data.
And, in addition to that, there were -- there was an e-mail alert module that I wrote that utilized asserted SMT libraries for things like restart, reboot, and maintenance required alerts.
Q. All right. Turning then to the next page, 157.3. Is this part of that same brochure?
A. It is, yes.

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Q. And what is shown here?
A. What's shown here is the BearBox automatic miner management system.
Q. So at the top it says: "BearBox automatic miner management system, version one."
What is that referring to?
A. It's referring to the -- the title of the annotated diagram.
Q. And is this an annotated diagram that you prepared?
A. I did, yeah. I drew it on my iPad Pro.
Q. And taking look at the top left, what is shown to the left of the word "software management," those two icons?
A. The two icons to the left-hand side of software management are reflective of lines of code on a -- on a black background, computer background.
Q. And working your way down from there, what is the hardware layer?
A. The hardware layer is -- it's representative of the Bitcoin mining computers or the ASICs, similar to what we saw earlier, the aluminum shoeboxes.
Q. What about the physical infra?
A. The physical infrastructural layer is representative of electricity transformers.
Q. I see what looks like windmills labeled as "generation assets," what is that?

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A. That's exactly what it is, it's a -- there's six wind turbines drawn here.
Q. And what's the lightening bolt under there?
A. The lightening bolt is representative of electricity.
Q. Then there's a pipe under that appears to have two paths.
What is shown at the bottom of the pipe?
A. At the bottom of the pipe, again, is a BearBox mining, shipping container full of the Bitcoin mining computers or ASICs.
Q. And what is shown -- the piece there there's going off to the right of the box?
A. The piece there off to the right is showing both the hourly or Day-Ahead Market for the pricing node and the 5-minute Real-Time market for that pricing node.
Q. And what are those dotted lines representing? One says "hourly," one says "five" in it.
A. Again, the dotted lines are representative of the option -- the optional path of electricity the flow down that branch or that portion of the pipe.
Q. And what's the difference between those two clouds?
A. One is a Day-Ahead Market, which is a 24-hour hourly market, and the other one is the Real-Time market, which is a 5-minute market.
Q. Okay. And the one leading to day-ahead LMP says

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hourly; why is that?
A. Because that market settles in hourly intervals in the day-ahead.
Q. And the one leading to RTMB LMP says 5-minute; why is that?
A. Because the Real-Time market balancing or Real-Time market settles as 5-minute intervals as well.
Q. And what dollar signs to the right of those clouds?
A. The dollar signs are representative of selling power for U.S. dollars in either of those markets.
Q. And then off to the right of the box at the bottom, what are those other currency entities?
A. Those are representatives of the Bitcoin symbol. They are used to represent mining Bitcoin.
Q. In what you're depicting here, who is selling the electricity in this diagram?
A. The generation asset would be selling electricity in this diagram.
Q. And who would control when to sell electricity to the grid or when to use electricity to mine cryptocurrency?
A. The generation asset would be the one who controls when to sell electricity to the grid or to sell power down to the mining container.
Q. So taking a look at the group of clouds at the top right that have the arrows coming off of software

management.
Generally, what is shown there?
A. Generally, those are different components of the BearBox automatic miner management system.
Q. Let's talk about each cloud. The first one is purple. It says Python.
What is that?
A. Python is a software development language that's utilized in the miner management system.
Q. Under that, there is an orange cloud.
What is that one?
A. The orange cloud is the Bitcoin core node. So Bitcoin core is the reference client for the Bitcoin network. From the Bitcoin core node we can query a bunch of different parameters about the Bitcoin network, like network hashrate and network difficulty.
Q. Back up to the -- oh, yes.
Yes, back up to the -- what is the yellow cloud that's underneath Bitcoin core node?
A. The yellow cloud depicts LAN, a local area network, cgminer watchdog with database table login. So again, cgminer is a portion of the software that runs on the individual mining machines. And the watchdog that I wrote looks across the local network, makes individual requests to those machines and then returns data about those mining

machines and then logs them in the database table.
Q. Okay. Back up at the top right, what about the small green cloud exchange API USD/BTC data?
What is represented there?
A. That is representative of a Bitcoin exchange or a cryptocurrency exchange in which you can request through their API, their application programming interface, the current price of the cryptocurrency in U.S. dollars.
Q. What about the blue cloud under there?
A. The blue cloud is representative of the postgreSQL. It's a structured query language database. It says postgreSQL database local or cloud. Meaning that the database that logs all this information can be local to the miner container or stored locally.
Q. What about the green cloud, custom PDU and fan control hardware and logic?
What is that?
A. So the green cloud is representative of the custom power distribution units and fan or environmental control; the hardware and logic associated with both of those units.
Q. And finally, what about the red cloud at the bottom of that grouping?
What is shown there?
A. The red cloud at the bottom of the grouping says Day-Ahead LMP and Real-Time market balancing LMP data feed

for ERCOT, the Southwest power pool and MISO.
Q. And what do the lines connecting these different bubbles mean?
A. The lines connecting these different bubbles show data being transferred between each of them.
Q. And what does that mean that they are exchanging data between them?
A. Yeah, they're exchanging data between them. So Python is the reference language that I used to write, I think, all of the automatic miner management system. Takes all of the data from each individual source and brings it all back into the postgre data that's either stored locally or in the cloud.
Q. Turning ahead and referring to Page 157.8, but this is another attachment that runs from 157.8 through 157.25. Let's just look at the first page.
What is this document?
A. This is a comma-separated value export of the database table simulations.
Q. Is this the modeling data that you mentioned in your cover e-mail to Mr. McNamara?
A. It is, yes.
Q. Why do you call it modeling data?
A. Because I was -- I was modeling -- I was modeling different -- different values in 5-minute intervals as it

related to mining Bitcoin versus selling power.
Q. Okay. So, again, generally, what is reflected in this modeling data?
A. Generally, what's reflected here is -- it's a bunch of different things. This is an export of the actual PostgreSQL database table and it's reflective of all the different values that are retrieved in the BearBox automatic mining system, and how those values are utilized in that system.
Q. Okay. And I see the date/time column. Does that reflect that these are 5-minute increments?
A. It does, yes. These are 5-minute intervals. The code is instructed to run every 5 minutes.
Q. How is the power used during each of those 5-minute intervals?
A. So the power being used, it really depends. What's contemplated here is the Day-Ahead LMP column, which, again, is the price in the Day-Ahead Market for each hourly segment. The Real-Time LMP column, which is the Real-Time in each 5-minute interval.
And then the actual break-even mining costs and the mining revenue associated with that.
Q. Well, let's take a look at some of the columns to show.
What are you showing for each of the 5-minute

Q. BearBox still exists as a company but makes no products, correct?
A. That is correct, yes.
Q. Has no employees but yourself?
A. Yes, correct.
Q. There's no assets?
A. No assets, correct.
Q. You don't have a computer science degree, do you?
A. I do not.
Q. You have a bachelor of science with a focus on geography?
A. Yes.
Q. So this morning you talked about the mining conference you attended in Boston on May 3, 2019, correct?
A. Correct, yes.
Q. Now, it's hosted by Fidelity, correct?
A. It -- it was hosted by Fidelity, yes.
Q. All right. So if I used the word Fidelity conference, you'll understand what I mean?
A. Yes.
Q. That conference was attended by people trying to tell products by mining entities, by finance entities, lots of industry folks, correct?
A. That is correct, yes.
Q. And you attended because you'd developed your

product, your BearBox, that you wanted to sell; isn't that right?
A. That is correct, yes.
Q. And one of the things your -- your goal was there was to go out and meet people and try to sell a product, wasn't it?
A. That is correct, yes.
Q. You also -- so let's pull up -- let's pull up TX947. So this is another version of text messages between you and Mr. Hakes, correct?
A. Yes.
Q. Same document, I think you guys had marked it as TX14, if I remember it right.

You spoke to Todd Garland at that -- well, first of all, with this -- did you intend with this document to be truthful?
A. Yes, I did.
Q. Take that down for a minute.

You spoke to Todd Garland at the conference, correct?
A. I did, yes.
Q. You talked to him about BearBox containers?
A. I did, yup.
Q. You told how BearBox containers could be used to help stranded energy?

A. Yes.
Q. You didn't have a confidentiality agreement with Mr. Garland, did you?
A. No, I didn't.
Q. Didn't tell him your conversations with him were confidential, did you?
A. I don't believe so, no.
Q. Todd Garland later gave you a job at Great American Mining, right?
A. He did, yes.
Q. Were you aware at the time you told him these things that Great American Mining was operating in stealth mode?
A. I'm not -- I'm not sure.
Q. You don't know if you were aware of that or not?
A. What do you mean by "stealth mode"?
Q. Did you speak to Jamie McAvity at the conference?
A. I did, yes.
Q. You didn't speak to Michael McNamara at the conference, right?
A. Technically not at the conference, but at the -- yeah, I see what you're saying.
Q. At the happy hour?
A. At the happy hour after, yeah.
Q. You had drinks at that happy hour, didn't you?
A. Yes.

Q. And you maintain that nothing you told Mr. McNamara at the happy hour was confidential, correct?
A. I believe so, yes.
Q. Did you communicate during discussions with GlidePath at the happy hour?
A. I don't believe so, no.
Q. Did you understand Lancium was in discussion with GlidePath at the happy hour?
A. No.
Q. So after the happy hour, you and a group of approximately eight people walked over to the hotel for dinner, correct?
A. Yes.
Q. And according to you, the group included Rich Godwin, correct?
A. Yes.
Q. Quinn Lawler?
A. Correct.
Q. Ben -- Chris Bendickson?
A. Yes.
Q. So Mr. Bendickson was with Coin Metrics, is that right, at the time?
A. It sounds right, yeah.
Q. Rich Godwin was with CoinMint?
A. That sounds right as well.

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Q. Quinn Lawler was with Coin Metrics?
A. I don't think Quinn was with Coin Metrics, no.
Q. Mr. Jesse Peltan was also at the dinner?
A. Jesse was at the dinner, too, yeah.
Q. James McAvity?
A. James was there.
Q. Michael McNamara?
A. Yes.
Q. Jon Cohen?
A. Yes.
Q. Anybody else?
A. Not that I recall.
Q. And at the dinner, what -- the atmosphere of the dinner was a casual business dinner in that room that you showed, wasn't it?
A. It was, yes.
Q. Friendly competitors talking shop, correct?
A. That's one way to characterize it, yeah.
Q. Is it the correct way to characterize it?
A. I'd say yes.
Q. And you testified you remember sitting across the table from Mr. McNamara; is that right?
A. That is correct, yes.
Q. Were you directly across or were you catty-corner?
A. Directly across.

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Q. Are you sure of that or is it just your memory now?
A. I'm sure at that.
Q. You had wine at the dinner, correct?
A. Yes.
Q. More than one glass?
A. Yes.
Q. You were talking to other people at the dinner, weren't you?
A. Yes.
Q. Talking in a normal tone of voice?
A. I believe so, yes.
Q. You were talking to Michael McNamara at the dinner?
A. Yes.
Q. Talking to Quinn Lawler?
A. Yes.
Q. Dinner lasted one and a half to two hours?
A. Somewhere in that range.
Q. During the dinner you never showed Mr. McNamara nor Mr. Cohen any documents, did you?
A. I don't believe so, no.
Q. You've never shown them any source code, have you?
A. No.
Q. Never shown them any of the other exhibits you put on the board except for the attachments to that one e-mail, correct?

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A. Correct.
Q. And the only place -- the only time you ever shown them those were attaching that e-mail, correct?
A. Correct, yes.
Q. And other than the conservation you had with him over dinner, you never talked to him again live, did you?
A. No, I -- I did not.
Q. You never talked to anyone from Lancium live, did you?
A. No, I did not.
Q. Never talked to Mr. Cline?
A. No.
Q. Didn't even know about Lancium before that conference, did you?
A. That's correct, yes.
Q. Never met Mr. McNamara, never heard of him, correct?
A. No.
Q. Did Mr. McNamara talk with other people at the dinner?
A. He did.
Q. A lot of other people?
A. Not -- I wouldn't say a lot of other people.
Q. So your conversations with Mr. McNamara, you never told him those conversations were confidential, did you?
A. Not that I believe.

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Q. You were in sales mode, right?
A. Yes.
Q. You were trying to generate interest in your box, correct?
A. Correct.
Q. And you say you picked up the check for your section, including Mr. McNamara and his CFO, correct?
A. Yes, I believe so.
Q. And your dinner -- after the dinner, you went out to a bar with Jesse Peltan, didn't you?
A. I might have, but I don't remember.
Q. Did you stay at the Envoy hotel or a different hotel?
A. I stayed at a different hotel.
Q. Let's talk a little bit about Mr. Hakes. You and Ben Hakes are friends, aren't you?
A. Yes, but I have never met him, but we are friends.
Q. Yeah, you became friends through the -- the GlidePath relationship, you talked about it this morning, didn't you?
A. Yes.
Q. You were introduced through Twitter, right?
A. Yes, he sent me a Twitter message.
Q. So let's go to Exhibit 947. This is part of that same text chain that we talked about earlier.
MR. NELSON: Can I get the TX56 at 11:11.
So it would be page 4,000.

BY MR. NELSON:
Q. You write to --
MR. NELSON: No, the one before.
BY MR. NELSON:
Q. So you write to Ben: I'm going to poke around and figure out if anybody else is doing what we're doing.
Correct?
A. Correct.
Q. And what you mean here, what we're working on is the stuff you were working on with Ben for GlidePath, right?
A. Correct.
Q. And then let's go down a little bit more to 11:11.
You write to Ben: There are people doing what we're trying to do in ERCOT ISO in Texas. Met a few of big energy guys... And you go on.
The people that are doing, present tense, is Michael McNamara, right, Lancium?
A. There are others, yes.
Q. Well, you're writing to Ben: There are people doing what we're trying to do at ERCOT, Texas, ISO in Texas.
And then go down to the next text message at 11:12. Ben writes back: "Woah," doesn't he?
A. Yes.
Q. And then you send him at 11:13 lancium.com, correct?
A. That is correct, yes.

Q. So the people you were referencing to in the earlier text at 11:11 was Lancium, wasn't it?
A. Yes.
Q. Then you sent McNamara's LinkedIn information at 11:13 a.m.?
A. Yes.
Q. Going to 11:17 a.m. you write: It was. The guys at Lancium are doing what we are trying to do exactly.
Again, present tense "are doing," correct?
A. Correct.
Q. What you and Ben were trying to do, right?
A. That's correct, yes.
Q. Exactly, correct?
A. That's what I said, yup.
Q. But they don't have a container builder or software team yet.
You didn't know at this time they didn't have a software team, did you?
A. I was under the impression that they did not.
Q. Did you know that?
A. No.
Q. Thank you.
At 11:25 you write down: Yep, and Michael McNamara wants me to bring some of my former product manager friends for his distributed compute service.

Ben writes back: "Woah."
Do you see that?
Then you said: He asked me if I was interested and I told him it'd have to be a hell of an offer.
Is that correct?
A. That's correct.
Q. Then you say: Plus they want my logic for curtailing miners on the DA and Real-Time LMP, right?
A. Correct.
Q. And then you start: All over dinner Friday night and several bottles of wine, they told me they were looking into Digital Shovel.
Do you see that?
A. Correct.
Q. And Digital Shovel is a manufacturing -- container manufacturer, right?
A. Correct.
Q. Then you say: Their Schneider Electric/Siemens engineer was worried about the 480/277 volts because of potential liability, i.e., the line to neutral voltage kills you if you touch it.
Do you see that?
A. Yes.
Q. Do you think, is that important to container manufacturers that they be safe?

A. It is.
Q. At the time you wrote this, did you know who Lancium Schneider Engineer Electric/Siemens person was that was being referred?
A. I did not, no.
Q. Go to the next message at 11:45. You write: There are certain business requirements that I'm simply not privy to. Unknown unknowns from the generation asset compliance side. That's GlidePath's backyard and I imagine it changes every jurisdiction in SPP and ERCOT ISO depending on regs, capital structures, etc.
Correct?
A. Correct.
Q. Go down to the next one at 11:51 a.m.
You say: "The thing" --
You write to Ben: "The thing that's currently setting me apart from everyone else is the fully integrated solution. There are plenty of hardware guys, but none are doing what I am doing from the software side because they don't know how."
Is that what you wrote?
A. Yes.
Q. You didn't know what Lancium was doing from the software side at this point, did you?
A. No, I did not.

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A. That is correct, yes.
Q. And then you responded a little later at 10:44: "Redoing one of the specs sheets for newer Whatsminer models."
Whatsminer is a miner, correct?
A. Correct.
Q. So the specs you're doing is a hardware spec sheet?
A. It is not a hardware spec sheet. I guess it would be a container spec sheet, yeah.
Q. And Mr. McNamara responds: "Great, thanks." Asks you if you've ever looked into building a GPU box.
Do you see that?
A. I do, yes.
Q. And then you say, "I haven't, but it's conceptually the same."
A. Yes.
Q. That's the entirety of the text communications between you and Mr. McNamara, correct?
A. Correct.
Q. There's nothing in these text communications that you believe found its way into the '433 patent, is there?
A. I don't believe so, no.
Q. So let's turn to Exhibit TX887.
And you testified earlier that this is the e-mail you sent to Mr. McNamara, correct?

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A. That is correct, yes.
Q. And your first sentence is: "See attached for the 20-foot BearBox product details and some supporting docs."
Correct?
A. Correct.
Q. And you also attached some recent modeling data from one of the Exelon wind sites based on publically available marketplace data, correct?
A. Yes.
Q. Is that Exelon four wind site data?
A. It looks like it's the Exelon four modeling data from the attachment, yes.
Q. The modeling data that's being attached, that's not box specs, is it? It doesn't relate to your specs for your BearBox. It's something different; right?
A. It is different, correct.
Q. So go to the bottom of this -- of this document. You see the confidentiality notice that's on the bottom?
A. I do, yes.
Q. It says: "This communication may contain private, confidential or legally privileged information."
And goes on; right?
A. Yes.
Q. And that's automatically attached to all of your e-mails, isn't it?

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A. It is.
Q. The only thing you considered confidential in any of the attachments that we'll get to in a minute is the spreadsheet; isn't that true?
A. That is correct.
MR. NELSON: So if I could get page Bates number 93, please.
BY MR. NELSON:
Q. So take a look at exhibit -- or page 93 -- Bates Number 93 of the exhibit.
This is just simply a piece of hardware for the box, right?
A. It is.
Q. You don't think anything -- any portion of the '433 patent relates to this piece of hardware, do you?
A. No.
MR. NELSON: Let's go to Bates page 44 -- 94, please.
BY MR. NELSON:
Q. And this is another piece of hardware for the box, right?
A. Yes.
Q. You don't think any portion of the '433 patent relates to this, do you?
A. No.

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Q. Let's go to page 95 and 96. This is fans -- fan hardware for the boxes, correct?
A. That is correct.
Q. You don't think any portion of the '433 patent relates to these, correct?
A. No.
Q. These two pages?
A. No.
MR. NELSON: So let's turn back to page -- Bates number 91.
BY MR. NELSON:
Q. So this is your product details, this is your specification, right?
A. It is, yes.
Q. Did you have any more detailed specification at this time or was this it?
A. I believe this was it for the box.
Q. And the top, where it says Bitmain S9j, DragonMint T1, are those Bitcoin mining manufacturing entities?
A. Yeah, they are specific mining computers, yes.
Q. So turning to the physical dimensions of the box. It's a 20-foot box, right?
A. Correct.
Q. Turning to the electrical system, it's a 373-kilowatt max load, right?

A. Correct.
Q. That's the maximum electrical load this box can handle?
A. No, it's -- it's not.
Q. What is it?
A. That's the electrical load that the Power Distribution Units can handle, but the box can handle more.
Q. It goes to miners?
A. Yes.
Q. How many kilo -- how many megawatts is that?
A. Almost 0.4.
Q. 0.373, right?
A. Yes.
Q. So let's go to the cooling system. This is an air-cooled box, right?
A. It is.
Q. Let's go to the total design hashrate. So the total design hashrate is 272 miners at 14.5 terahertz per second each, right?
A. Yes, it's terahash per second, but yes.
Q. Oh, sorry, I know I said hertz by mistake, yeah.
And it's 3.9 petahash per second, right?
A. Correct.
Q. This sheet doesn't indicate whether these -- any of the components on here meet the electrical codes, does it?

A. It does not indicate that, no.
Q. This sheet does not indicate that the components are designed to meet other safety codes either, CEL certification, for example?
A. It does not, no.
Q. This sheet does not indicate a fire suppression system, correct?
A. No, it does not.
Q. If you go down to the summary, so the summary is 373 kilowatts max load, doesn't include miners, correct?
A. Correct.
Q. Doesn't include other exterior electrical structures like transformers?
A. Correct.
Q. Does it include your optional Real-Time break-even monitoring or not?
A. It -- it does not, it's -- it's listed as optional.
Q. And that's what the optional means?
A. Yep.
Q. So that would be extra?
A. Yes.
Q. And it's got a price of 86,000 -- almost 95,000 after taxes, correct?
A. That is correct, yes.
Q. In looking at your optional Real-Time break-even

monitoring, this feature had only been simulated at the time, right?
A. Correct.
Q. It was actually never implemented into a box at all, was it?
A. Correct.
Q. And you -- you sold one of these boxes total throughout BearBox's existence in making boxes, right?
A. Correct.
Q. You sold it at a loss?
A. Yes.
Q. So let's go to page 92. Now, you include this as product details, but this isn't part of the product spec, this is something else, isn't it?
A. Correct.
Q. So if you look at the two red bubbles sort of above the container. So I think you testified earlier that the gold structure with the silver cross hatch pieces, you -- that's a Bitcoin mining container, right?
A. That is correct, yes.
Q. That's what it's intended to represent.
And so if you take the top box, Day-Ahead LMP for pricing node, that is a price, right?
A. That is a power price, yes.
Q. And RT LMP for pricing node, that is also a power

price, right?
A. Correct, yes.
Q. It's not electricity, it's a price?
A. Correct, yes.
Q. Is it a zonal price or nodal price?
A. These are nodal prices.
Q. Do you know the difference?
A. I do.
Q. These are data feeds -- these are data feeds coming from publically available sources, correct?
A. Correct.
Q. This drawing in not only this part but the whole drawing, there's no mathematical calculations in here, correct?
A. Correct, there's not.
Q. The drawing does not show a connection to the grid, does it?
A. It does.
Q. What do you maintain as the grid connection?
A. Both branches of the pipe that do not feed the container.
Q. You just told me a minute ago it was electricity. On direct I thought you testified it was electricity?
A. No, not the -- not the pipe.
Q. So the two bubbles are simply price; is that right?

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A. Correct.
Q. So if it's simply price then this drawing does not show the Bitcoin miner connected to the grid, right? Electrically connected to the grid.
A. I'm not sure that I understand your question.
Q. So my question is: This drawing does not show that the Bitcoin miner is electricity connected to the grid, connected to the wind farm by the power bolt, correct?
A. It's also connected to the grid because those two clouds are a function of the grid.
Q. They are a price data, though, they are not power data. It's not electricity connected to the grid?
A. That's -- that's what the pipe is supposed to signify.
Q. So you just told me that the two bubbles, Day-Ahead LMP for pricing ARB and RTBM for pricing ARB is giving you price -- it's giving price information?
A. That is correct, yes.
Q. So you're saying it's also giving you electrical power?
A. That's not what I said.
Q. Okay. And so I'm asking, does -- is the drawing here intended to represent this box being electrically connected to the grid directly as opposed to being connect to the wind farm?

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A. It can be connected by both.
Q. I didn't say it can be, I asked if this drawing shows it?
A. Yes.
Q. Where?
A. At the connection to both the wind farm and the grid pricing markets in the Day-Ahead Real-Time. There's a coupling there.
Q. You're talking about the satellite thing on the right quarter of the box or the coupling on the left that's going to the wind farm?
A. The coupling to the pipe.
Q. Okay. This drawing doesn't indicate turning miners on and off, does it?
A. I don't believe so, no.
Q. Does it indicate turning some miners on or off, does it?
A. It does not, no.
Q. The drawing doesn't -- doesn't indicate controlling the miners at all, does it?
A. It does not indicate controlling the miners, no.
Q. Together, neither drawing nor the bullet point specification indicates that this system measured the actual power being consumed by the build at a point in time, correct?

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A. Correct.
Q. And you posted this -- you don't consider this drawing confidential and posted it on Twitter, correct?
A. I don't consider this confidential, no.
Q. You put it on Twitter?
A. I did put it on Twitter, correct.
MR. NELSON: And can I get TX901. And let's go down to the next page, page -- Bates number 718.
BY MR. NELSON:
Q. Is that the drawing right here?
A. That does look like the drawing, correct.
MR. NELSON: And then let's turn to the spreadsheet, page 97.
BY MR. NELSON:
Q. And this comes from the simulation you were running in your home, correct?
A. Yes, I believe so.
Q. And was using historical data that you had gotten from GlidePath?
A. No, I had not received this data from GlidePath.
Q. Okay. But at this point in time, you -- you were scraping data from the GlidePath Exelon 4 location using another method?
A. Yes -- oops, yes.
Q. You knew that -- you knew BearBox was a market

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participant with an independent service operator at this point, correct?
A. Correct, yes.
Q. So just taking look at the columns real quick. So the Bitcoin price, that's publically available data, correct? Column A?
A. That is, that is publically available, yes.
Q. Column B, that's also publically available data?
A. Correct.
Q. Going over the date and time, that's publically available data?
A. Correct.
Q. Day-Ahead LMP is publically available data? Column E?
A. Correct.
Q. Column G, the estimated network hashrate, that's publically available data?
A. It is, yes.
Q. Column I, the network diff, that's -- that's publically available data?
A. It is, yes.
Q. The Real-Time LMP is publically available data, right?
A. It is, yes.
Q. So the Day-Ahead LMP, that's the price of power in

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the Day-Ahead Market; is that right?
A. That is correct, yes.
Q. And the Real-Time LMP is the price of power in the Real-Time market?
A. That is correct, yes.
Q. And so if I understood your testimony this morning, the entity that you -- the entity had an option to sell the power in either the Real-Time market or the Day-Ahead Market; is that right?
A. Which entity?
Q. The entity you testified that this spreadsheet represented?
A. Yes, it is.
Q. Which was what entity?
A. The power generator.
Q. So how can you sell power in the Real-Time market if you're -- that's power you're going to be done with.
How can you sell that in the Real-Time market and the Day-Ahead at the same time?
A. I'm not sure I understand your question.
Q. Well, if you have an option -- if you're using -- if you're generating the power now, how can you sell it in the Day-Ahead Market?
A. I see what you're saying.
If you're generating the power now, how can you

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sell it in the Day-Ahead Market?
Q. Yes.
A. You obligate yourself the previous operating day to sell the power in the Day-Ahead Market.
Q. But this is using current day-ahead -- this is using tomorrow's Day-Ahead LMP prices, isn't it?
A. I don't believe so, no.
Q. You can't sell into the Day-Ahead Market in 5-minute increments, correct?
A. Not that I'm aware of.
Q. So how can the generator sell into the Day-Ahead Market when the Day-Ahead Market doesn't accept 5-minute increments?
A. The Day-Ahead Market, it's an hourly market and the LMP values don't change for 12 intervals, which represents 60 minutes.
Q. So let's look at the values here, the break-even mining clause.
Do you see that, column C?
A. I do, yes.
Q. That's a calculated value, correct?
A. That is a calculated value.
Q. Column F, the Day-Ahead LMP revenue, that's a calculated value?
A. That is a calculated value, correct.

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Q. Column H, the mining revenue, that's calculated value?
A. Correct, it is.
Q. And column K, the Real-Time LMP revenue, that's calculated value?
A. Correct.
Q. Correct?
A. It is.
Q. Now, this spreadsheet doesn't contain any of the mathematics that reveal the algorithm underlining these calculations, does it?
A. No, it does not.
Q. And the decision that's being made on this spreadsheet is whether to mine Bitcoin or sell the power back; is that right?
A. That is correct, yes.
Q. There's no obligation to use a specific amount of power represented in this spreadsheet, correct?
A. What do you mean by obligation?
Q. Just what I said, there's no obligation to use a specific amount of power that's reflected in this spreadsheet.
A. The obligation is to mine when it's profitable to mine, so, yes and no.
Q. Well, you said the spreadsheet now is from the

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generator prospective, so the generator wouldn't be mining, would it?
A. No, but this contemplates -- this contemplates mining.
Q. So who owns the miner the -- are you saying the generator who owns the miner? Is that who owns it?
A. The generator doesn't own the mining equipment in this scenario, no.
Q. Are the generator somehow making decisions for the Bitcoin miner?
A. The generator is making decisions for itself.
Q. And why would the generator care about whether it was going to mine Bitcoin or not?
A. Because it realizes more revenue in the contemplated transaction by mining Bitcoin than by selling power.
Q. So in the imaginary contemplated transaction where the Bitcoin owner doesn't own -- or the generator doesn't own the Bitcoin miner, somehow the generator makes more money?
A. I'm -- the electricity is worth more by mining Bitcoin during those periods. Whether or not the generator makes more money is a function of the business contracts.
Q. And so the generator is making the decision for the Bitcoin miner that it doesn't own whether the Bitcoin miner can mine Bitcoin or not?

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A. That is correct.
Q. That's what you're saying now? Okay.
A. That is correct here.
Q. So the simulation that you ran to model -- to create this spreadsheet, that was in your apartment, right?
A. It was on a computer in my apartment, yes.
Q. And that was hooked up to a Bitcoin miner, wasn't it? One miner.
A. It was, yes.
Q. And the simulation was turning that miner on and off, right?
A. Correct.
Q. So the one that you ran in the apartment and the code that you actually wrote was for turning a Bitcoin miner on or off from the perspective of the Bitcoin miner making the decision, wasn't it?
A. Not necessarily.
Q. So you wrote a simulation and you wrote code from -- that turned a Bitcoin miner on or off?
A. That is correct, yes.
Q. You never wrote a code to let a generator turn on or off, did you?
A. I'm sorry, can you repeat that question.
Q. Yeah, let me --
You never wrote code that controlled a

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generator, did you?
A. I did not write code that let me control the generator, no.
Q. So as of May 3, 2019, your only understanding of Ancillary Services were that peaker plants existed and were paid to turn on almost like grid insurance. You had no other understanding of Ancillary Services; is that correct?
A. Somewhat correct, yes.
Q. Is it correct; yes or no?
A. Yes.
Q. You were not the first person to come up with the concept of hashrate, were you?
A. I was not, no.
Q. You were not the first person to come up with the concept of block height, were you?
A. I was not, no.
Q. You were not the first person to come up with the concept of using computer systems to mine Bitcoin?
A. I was not, no.
Q. You were not the first person to come up with the concept of the LMP for energy price, Locational Marginal Price?
A. I was not, no.
Q. You were not the first person to come up with the Day-Ahead Market?

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A. I was not, no.
Q. You were not the person who came up with the Real-Time Market balancing price?
A. I was not, no.
Q. Not the first person to recognize energy was priced in 5-minute increments?
A. I was not, no.
Q. Not the first person to understand that computers could be used to mine Bitcoin?
A. I was not, no.
Q. And, in fact, you said you know for a fact that you're not the first person -- that you're not the first person to look at the power cost to mine Bitcoin versus the mining revenue for a Bitcoin and to make a decision whether to mine or not based on profitability, correct?
A. That is correct, yes.
Q. You use the term fine-grained load control in some of your documents.
Do you remember that?
A. I do.
Q. And by that term you simply mean the ability to turn on or off miners within a build rather than turn the entire build on or off; is that correct?
A. That is correct, yes.
Q. Mr. McNamara never worked with you on your

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technology, did he?
A. No, he did not.
Q. You never worked with Mr. McNamara or Lancium on its technology, did you?
A. No, I did not.
Q. You never even met Ray Cline, right?
A. Correct.
Q. And other than the e-mail that you sent -- the e-mail that you sent on May 9th, you never reached out to Mr. McNamara again, did you?
A. That is correct.
Q. So let's take all these documents together that we've just talked about, TX -- get the exhibit number here.
All the documents together in TX887. Nowhere in any of these documents is there any indication that your simulation required that a certain amount of power be used by the build, correct?
A. That is correct.
Q. And nowhere in any of these materials is there an indication that you simulated that the mining build must utilize at least -- specified amount of power for a specified time period, correct?
A. Correct.
Q. And nowhere in any of these materials is there an indication that your simulating mining build must utilize at

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least a specified amount of power for a specified time, period, regardless of whether it is profitable to mine Bitcoin for such power at that specified time period, correct?

A. That is correct, yes.

Q. And nowhere in any of these materials is there an indication that you're providing a power entity with the option to curtail a specified amount of power used by your simulated mining build, correct?

A. That is not correct.

Q. Nowhere in any of these entities is there an indication that the simulated mining build incorporated a to strategy to make sure it used that specified amount of power for a specified time period such that the amount could be curtailed by the power entity mining, correct?

A. Can you ask that one more time, I'm sorry.

Q. Sure. In nowhere in any of these materials is there an indication that the simulated mining build incorporates a strategy to ensure it uses a specific amount of power for a specified time period such that the amount could be curtailed by the power entity?

A. That's not correct.

Q. Your simulated mining build the power, the power it used as depicted in your source code was a fixed value, right?

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A. I believe so, yes.

Q. It was hard coded into the simulation, right?

A. Yes.

Q. And the only way to change the value and the code is to actually physically go in and change the code, right?

A. Yes, that's correct.

Q. So let's go to TX932. I think this is the e-mail chain that your counsel put up this morning when you and Ben Hakes were introduced to one another.

Do you see that?

A. I do. It's a bit blurry, but I do see it.

Q. So let's go to page 1044. --

THE COURT: Mr. Nelson, if you have a lot more, we'll -- at an appropriate time, we'll take the lunch break. If you think you can finish him up, then we can -- what's your thought?

MR. NELSON: It's probably a lunch break, Your Honor. This is kind of a new section now, so it's probably a good time.

THE COURT: Okay. Let's take an hour lunch break. We'll come back at 2:10.

(Lunch recess taken.)

THE COURT: All right. You may be seated. You can continue.

BY MR. NELSON:

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Q. Mr. Storms, before your direct testimony today at some point, were you given a script by your lawyers of that testimony?

A. Before my -- I don't know what direct testimony is, I'm sorry.

Q. The testimony you gave this morning, were you provided a script of that testimony by your lawyers?

A. No, I wasn't provided a script of it.

Q. You understood a -- you understood a Power Purchase Agreement is an agreement to purchase power at a set price and a fixed volume, correct?

A. That is correct.

Q. You understand that May 3rd 2019?

A. That is correct.

Q. You understand that today, don't you?

A. That is correct.

Q. So turning back to your simulation and documents. Your simulation, maintaining the load level above a certain value is not important to that simulation because the intent was that the build would run at 100 percent if it was profitable to mine and it would run at 0 percent if it was profitable to sell the power back, correct?

A. You're going to have to ask that one more time, I'm sorry.

Q. So maintaining the load level above a certain value

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was not important to your simulation because the intent was the build would run at 100 percent if it was profitable to mine and 0 percent if it was more profitable to sell power back, correct?

A. That is what was simulated, correct.

Q. In situations where it was more profitable to sell power back, the intent was power would be shut off to all miners, correct?

A. That is correct, yes.

Q. And in the simulation, the decision to mine or not mine was made by the load?

A. In the simulation, the decision to mine or not mine is made in the Python script, that is correct.

Q. By the load?

A. By the load or by whichever entity.

In the simulation, there was optionality around which entity could actually curtail the machines.

Q. You testified earlier that you had no way to build other simulations when the decision was made by a different entity, correct?

A. That is not correct.

Q. I took your deposition.

Do you remember that?

A. I do.

Q. You testified under oath, correct?

A. Correct, yes.

MR. NELSON: May I get Storms' deposition testimony 224 at 16 through 20.

"Q. And I understand you, you said you contemplated others but you didn't build -- you didn't build out the others one, did you?

"A. No, I didn't -- I didn't have a way to build out other ones, yeah."

(End of clip.)

MR. NELSON: And let me get 224, 7 through 15 as well.

(Clip.)

"Q. I think I asked you this before, but the decision point here then to mine or not to mine was basically made by -- in your model it was made by you as the load; is that fair?

"A. Yeah, that's one example, yes.

"Q. Well, that's the example you built, right?

"A. In the model.

"Q. Yes.

"A. That's one example, yeah."

(End of clip.)

MR. NELSON: Could I get Exhibit 920.

BY MR. NELSON:

Q. This an e-mail you sent to Mr. Todd Garland, right?

A. That that correct, yes.

Q. The Todd of BuySellAds is Todd Garland?

A. Yes.

Q. And that is the same Todd Garland that was in later in great American mining?

A. Yes.

MR. NELSON: Could I get page 2523.

Bates 2523, is that on here? Okay. We'll skip that one.

Can I get Exhibit 919.

BY MR. NELSON:

Q. And if you go to page 0909. And this is Todd at BuySellAds e-mailing you May 6, 2019. He had a question, he says, about the sheets. "What do you factor into the break-even mining costs?"

Do you see that?

A. I do, yes.

Q. And that's because Mr. Garland can't tell from the spreadsheets you sent what the calculations were; is that right?

A. That doesn't appear to be correct based on the other context in this e-mail, no.

Q. You respond by sending portions of your source code, correct?

A. That is correct, yes.

Q. And if you go up to the first portion of this e-mail, Exhibit 919. And is this the -- the def_getbreakeven_USDcore per kilowatt hour portion, the first black box of code, is that code that was running in your simulation?

A. I believe so, yes.

Q. Going down that e-mail a little bit further. Right at the bottom you say: "So I'm not sure I need to get the PDUs UL certified themselves, they aren't manufactured, they're simply assembled out of existing components," correct?

A. That's correct, yes.

Q. And so your PDUs for your boxes were not UL certified at this time; is that correct?

A. That is correct, yes.

MR. NELSON: Can I get Exhibit 945.

BY MR. NELSON:

Q. This is the now 5/14 -- May 14th, 2019. You tell Todd --

MR. NELSON: Can I get the highlight pulled up?

BY MR. NELSON:

Q. Well, very first sentence you -- you're talking about the conference and you say: "A good number of the wind folks are seemingly scared of the compliance side. Michael McNamara and his team at Lancium are also working on the

energy side of ERCOT's ISO in Texas. They're interested in my containers and have energy contacts."

Do you see that?

A. I do, yes.

Q. Mr. -- you're not recounting that Mr. Garland was interested in your PDUs, are you? It's not said here, is it?

A. I'm not sure I understand your question.

Q. Well, what you recite, that McNamara and his team at Lancium were interested in from you in this -- in this rendering of -- of what occurred in the context of your May 3rd dinner is that they are interested in my containers, correct? That's what you say here?

A. That would be correct, yes.

MR. NELSON: And if you go down a little bit -- a little bit further. Go back up.

BY MR. NELSON:

Q. So in another portion of this e-mail -- oh, the next -- the very next line, you say: "I'll ping him and see what they have available to try and loop you guys in regarding wind signs."

Do you see that?

A. I do, yes.

Q. And the him you're speaking of is Michael McNamara, right?

A. That is correct, yes.
Q. And this is five days after you sent him that e-mail on May 9th, correct?
A. That is correct.
Q. You never talked to Mr. McNamara, did you?
A. No, I did not.
MR. NELSON: Can I get Exhibit 908?
BY MR. NELSON:
Q. And this is an e-mail on June 1st between you and a Mr. Eric Franzen.
Do you remember Eric Franzen?
A. I do, yes.
Q. And there's a graphic at the end of this e-mail.
MR. NELSON: Can I get the graphic pulled up real quick, at the very end.
BY MR. NELSON:
Q. That's something Mr. Franzen created, correct?
A. I believe so, yes.
Q. And if you go --
A. Yes.
Q. -- to the front of the e-mail, you say: "It's currently" -- you respond -- well, let me ask you this: Did you intend in your response to Mr. -- to be true and correct in your response to Mr. Franzen?
A. Yes, I believe so.

Q. Let's go to Exhibit 890.
So this is now an e-mail between yourself and Mike Hoadley of GlidePath copying a bunch of other GlidePath folks, correct?
A. That is correct, yes.
Q. Now this is August of 2019, correct?
A. Yes.
Q. All right. And you continue to communicate with GlidePath for many, many months, correct?
A. Correct, yes.
Q. You never did a deal with GlidePath, did you?
A. I did not, no.
MR. NELSON: And then let's get 89 -- Exhibit 898 as well.
BY MR. NELSON:
Q. Now, this is May 2020. Again, you to Denis Labij and other GlidePath folks, correct?
A. Correct, yes.
Q. And, again, you're still continuing to communicate with GlidePath, correct?
A. Correct, yes.
Q. But you only reached out -- you never reached out to McNamara again after one e-mail, correct?
A. Correct, yes.
Q. You're aware that Lancium asserted the '433 patent

against Layer1, correct?
A. I -- I am aware of that, yes.
Q. In a previous lawsuit, right?
A. Yes.
Q. And you learned of that from a press release or about August 17th -- or you learned about on August 17th from a press release dated a couple days earlier, correct?
A. I believe so, yes.
Q. And then shortly thereafter, I think three days later, you contacted Layer1's attorneys, correct?
A. That is correct, yes.
MR. NELSON: Can I get Exhibit 906.
BY MR. NELSON:
Q. And this is the e-mail that you sent to Layer1's attorneys, correct?
A. That is correct, yes.
Q. And in that e-mail, you attach the same documents that you sent to Mr. McNamara, right?
A. Correct, yes.
Q. In fact, if I get the e-mail scrolled down a little bit, you forward the entire e-mail that you sent to Mr. McNamara, correct?
A. That's correct, yes.
Q. And you talked to Layer1's attorneys for quite some time, correct?

A. I did.
Q. You never intervened in that lawsuit, did you?
A. I'm sorry, one more time?
Q. You never became part of that lawsuit, you never intervened on your behalf, did you?
A. No, I didn't.
MR. NELSON: Can I get Exhibit 72. And can I get you to go to Bates number 10, I think.
BY MR. NELSON:
Q. So the circle on the figure here on Bates number 10, that's a miner, correct?
A. Correct, yes.
Q. And this is running in Jason Hustler's lab, right?
A. Yes, it is.
Q. And this doesn't have your simulation running on it, does it?
A. I'm not sure.
MR. NELSON: Go to page 18, please.
BY MR. NELSON:
Q. So I think you've shown this screen this morning. This is a manual graphical user interface, isn't it?
A. It is, correct.
Q. This was not part of your simulation, was it?
A. No, it was not.
Q. Didn't have anything to do with your simulation, did

it?
A. I wouldn't say it didn't have anything to do with it, but, sure, yes.
Q. All right. Did it have something to do with your simulation or didn't it?
A. No, it didn't have anything to do with the simulation.
Q. All right. This was also at Jason Hustler's lab, right?
A. It was, yes.
MR. NELSON: And let's get pages 21 and 22.
BY MR. NELSON:
Q. So you talked about these earlier. These were at Jason Hustler's lab, right?
A. They were, yes.
Q. These didn't have anything to do with running in your simulation, did they?
A. That's -- no, they did. One of them did.
Q. 21 or 22?
A. 22 did.
Q. Remember I took your deposition, didn't you?
A. I do, yes.
Q. Did you testify differently at the deposition?
A. I don't believe I did, no.
MR. NELSON: Can I get clip 254, 20, through

255, 14.
(Video clip was played as follows:)
BY MR. NELSON:
Q. Okay. So where is 21 located?
A. 21 is the test bench upstairs, again at Jason's lab.
Q. Okay. 22, the same thing?
A. Yes.
Q. 23, the same thing?
A. Yes.
Q. 24, the same thing?
A. Yes.
Q. 25, the same thing?
A. Yes.
Q. 26, same; 27, the same?
A. Same location, different power distribution, though.
Q. And none of -- none of these that we're talking about at Jason's apartment -- or Jason's location, just to be clear, none of these ever were used in running the model, right?
A. Correct.
(Video clip ended.)
MR. NELSON: Let me get -- hold up.
BY MR. NELSON:
Q. In the software that you wrote for the simulation involving power pricing was not intended to be implemented

by the PDUs, correct?
A. Say that one more time, I'm sorry.
Q. The software you wrote for the simulation involving power pricing was not intended to be implemented by the PDUs, correct?
A. It is intended to be implemented by the relay controller and the switch PDUs.
MR. NELSON: Can I get you clip 258, 11 through 17.
(Video clip was played as follows:)
BY MR. NELSON:
Q. So the software model we talked about for power, for power pricing and things, was that ever intended to be implemented by the PDUs or was it intended to be implemented by something else?
A. Something else.
Q. And what -- what was that something else?
A. Some type of control system.
(Video clip ended.)
MR. NELSON: Can I get TX20?
BY MR. NELSON:
Q. So this -- you showed this this morning, and this has a bunch of the source code on it that you sent to Jason, correct?
A. Correct.

Q. And you see up there it says Denis_logic_newgen?
A. Correct.
Q. And keep that highlighted. And there's another Denis one, too, a little bit further down. So that's Denis with one N, correct?
A. That is correct, yes.
Q. And that's the same way that Denis Labij of GlidePath spells his name, isn't it?
A. That is the same way Denis spells his name.
Q. And, in fact, the logic that's -- the source code relates to came from your conversations with Denis Labij, didn't it?
A. Parts of it does.
MR. NELSON: Can I get TX22, please.
BY MR. NELSON:
Q. And this is another -- did you write this source code?
A. I did, yes.
Q. This is another Denis logic file, isn't it?
A. It is, yes. I -- it looks like it is. I can't really tell.
Q. Go to TX22-5. Or page 0005. File name "Denis_logic.PY."
Does that refresh your recollection?
A. It does, yes.

Q. So that's -- okay.
Let's go to 957, Exhibit 957. Is there any way to make these a little bigger?
BY MR. NELSON:
Q. So this is a series of Slack messages between yourself and different folks at Great American Mining, correct?
A. Correct, yes.
Q. And the drawing there is the same drawing that you attached to Mr. McNamara -- the e-mail that you sent to Mr. McNamara?
A. Yes, it is.
Q. And near the bottom 11:07 a.m. you say: "This is what Layer1's demand response -- controllable load resource program is in a kindergarten nutshell."
Correct?
A. Correct, yes.
Q. And the allegations that form the basis of the complaints in this case are also based in part on that drawing, correct?
A. Some of them are, yes.
Q. So at the time of the Layer1 suit, you were aware of the allegations you're asserting in this case, it just took you a while to bring this lawsuit; is that fair?
A. That's fair.

Q. Go to page 953. I'm sorry, it's Exhibit 953. Okay.
Look at page 109. So you see there it looks like a press release announcing that Lancium filed a patent infringement suit against Layer1?
A. I do see that, yes.
Q. And the '433 patent the one that's at issue in this case, was the subject -- was being asserted in that case by Lancium, right?
A. Yes, it was.
Q. And if you go to page 111 of this exhibit. This is you at 3:49 p.m. saying: "LOL, no, it sounds like we should make a public spectacle of them."
Do you see that?
A. I do see that.
Q. And you're referring to Lancium, right?
A. Yes.
Q. Go to page 113. And you say: "I'm not just familiar -- I'm just not familiar enough with patent law to even understand if that constitutes prior art. There wasn't ever an NDA between me and Lancium/Michael McNamara so it might." I won't repeat the LMFAO vernacular in open court, but I think we all know what that means.
You wrote that, correct?
A. I did write this, yes.
MR. NELSON: Let's go to Exhibit 955. And can I

go to page 119.
BY MR. NELSON:
Q. So if you start out sort of the second paragraph: "The entire grid in issue is because ERCOT and SPP have demand prediction algorithms that rely too heavily on renewable generation."
I'll skip this part. I'm not able to find it quickly enough.
Let's go to February -- the same exhibit, page 1 -- February 17, '21, page 128 at 6:20 p.m.
So you see the above part there. Looks like a press release announcing a different Lancium patent.
Do you see that?
A. I do see that, yes.
Q. And in the highlighted portion you state: "I'm going after him for this because it directly affects what we're doing at GAM," meaning Great American Mining, correct?
A. That is correct, yes.
Q. "Under this patent, we wouldn't be able to tie an NGCC plant into the grid and mine Bitcoin behind the meter without a license from him?"
Do you see that?
A. That is correct, yes.
Q. Then you write: "I'm going to blackball him from the entire industry like I did Dave Carlson."

Do you see that?
A. Yes.
Q. And you filed class action lawsuit against Mr. Carlson, correct?
A. I did.
Q. And that suit was paid for on contingency, correct?
A. Partially.
Q. And then on March 8, 2001, you learned of one Layer1's settlement with Lancium through another press release, correct?
A. I believe so, yes.
Q. Approximately a day later, you told Todd Garland at Great American Mining that you had engaged a law firm from Chicago in this suit, correct?
A. I believe so, yes.
Q. And about three months later you filed this lawsuit, correct?
A. That timeline sounds correct, yes.
Q. And this lawsuit is being largely paid for by Great American Mining and Todd Garland, correct?
A. That is correct, yes.
MR. NELSON: All right. Let me move in exhibits. I got the list here.
So, Your Honor, I want to move in Exhibits 899, 915, 014, 947, 950, 901, 932, 887, 920, 919, 945, 908, 890,

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A. The Day-Ahead LMP for that pricing node is the price of power, that's correct.
Q. And the hourly dots there are intending to indicate a data feed that the system is getting it?
A. The hourly dots are, correct.
Q. Yeah. And the 5-minute dots under RT/MB LMP of pricing mode, that's intending to indicate a data feed as well, getting that, right?
A. That does indicate a data feed, correct.
Q. But somehow this pipe then also indicates a grid connection, that the data feed turns into electricity connection of the grid.
Is that your testimony?
A. The pipe does not -- it does not turn a grid connection into a data feed, if that's what you're asking.
Q. So is it a magic pipe that when you want it to be a data feed, it's a data feed and when you want it to be an electricity connection, it's an electricity connection?
A. No. It's that the pipe is to signify the physical delivery of electricity in the system. And from that branch in the pipe, there are two markets in which the electricity could be sold the Day-Ahead Market or the Real-Time Market. The clouds are to signify pricing.
MR. NELSON: No further questions.
THE COURT: All right.

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MR. LABBE: No further questions from us, Your Honor, thank you.
THE COURT: All right. You may step down.
MR. HORTON: Your Honor, we're prepared to call our next witness, but we also prepared a short proffer for Professor McClellan or we can do that prior to Professor McClellan taking the stand.
THE COURT: Let's do your second witness and then we'll deal with Professor McClellan.
MR. HORTON: Okay. Thank you, Your Honor.
The plaintiffs call Frank McCamant to the stand.
(Whereupon, Frank McCamant was sworn and testified as follows:)
MR. HORTON: Your Honor, may I approach the witness?
THE COURT: Yes.
DIRECT EXAMINATION
BY MR. HORTON:
Q. Good afternoon, Mr. McCamant.
May it -- would you please introduce yourself to the Court?
A. Yes, my name is Frank McCamant.
Q. Would you please explain briefly what you're here to testify about today.
A. Yes, I'm here to testify about electric

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interconnected systems, how they're operated, how they are managed and power markets.
Q. Where do you live, Mr. McCamant?
A. Austin, Texas.
Q. Where do you currently work?
A. I work for my own firm called McCamant Consulting.
Q. And how long have you had the firm McCamant Consulting?
A. Since 2008.
Q. What does McCamant Consulting do?
A. It works with various clients, entities that are looking -- public and private entities that are looking to purchase power in the wholesale markets. Helping clients with power -- different power development projects, things like that.
Q. And what is a power supply and management -- what does that mean?
A. Well, it means -- it's typically working with utilities that have to purchase their power supply in the wholesale market.
Q. Do you have a slide that might summarize your areas of experience?
A. Yes.
Q. And could you please explain what's on the slide?
A. Sure. As I mentioned, first bullet there is

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wholesale power supply. That would be working with electric utilities that are purchasing their power supply in the wholesale market. So the procurement, negotiation, and administration of those kind of purchase power agreements.
Participating in the ERCOT stakeholder process on different activities that are going on there with -- with either protocols or different changes in some of the products in the market, sometimes representing different clients in that stakeholder process.
Also, monitoring activities at the Public Utility Commission of Texas, the PUCT, in terms of any new rule-makings or regulations that are being passed down by that regulatory body.
Part of the work in the ERCOT market is monitoring what's going on with prices, pricing events, pricing changes. And in cases, doing analytics for my clients in terms of how those pricing events may affect them financially.
And then the area of demand and response. That's essentially working with clients that can modify or change their consumption of electricity for demands -- demand response opportunities or load resource opportunities.
Then the next one is distributed energy resources. That's referring to things like rooftop solar on

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residential or small businesses, or the same kind of small batteries that residences or businesses may use and how they may participate and get integrated into the market.

And the last one, which is power project development. Essentially working with entities on things like smart grid projects or different power projects.

Q. What sort of background do you need to do this sort of work?

A. Well, you would need to have technical knowledge and experience on -- on electric grid operations. But also you would need to have some expertise and knowledge on the business side for the power markets.

Q. How long have you worked in this industry?

A. For almost 47 years, since I was in college.

Q. Can you tell us about some of the clients you've had at McCamant Consulting.

MR. HORTON: And go to the next slide, please.

THE WITNESS: Sure. Here I just highlighted a few of the clients I've had. The first one is with a consulting consortium called Utilicast. There they do some work in the newly deregulated electric market in Mexico.

And the piece that I provided was a report on the demand response capabilities or opportunities in that newly deregulated market mand that was a report that was given to the electric regulatory commission in Mexico.

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And then, as I mentioned, the utilities that I work with on wholesale power supply arrangements, I've been doing that ever since I started McCamant Consulting.

And then I worked with a smart grid company called Consert, that their product as they were working to aggregate residential or commercial demand response, or load resources, into what we call in the industry a virtual power plant. We're essentially aggregating those resources so they could operate like a power plant, virtually.

BY MR. HORTON:

Q. Where did you go to college, Mr. McCamant?

A. The University of Texas in Austin.

Q. What did you get your degree in?

A. Minor graduate degree in civil engineering. And then I went back and got an MBA.

Q. What sort of courses did you take?

A. Well, on the engineering side, of course I took a lot of math, sciences-type courses. But when I went back and got my MBA, I describe that as saying it recalibrated my engineering mind into a business mind.

Q. What year did you graduate?

A. My undergraduate degree was in 1977, and my MBA was in 1992.

Q. What did you do after graduating college in 1977?

A. Well, I mentioned that I worked in college in the

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industry, I worked for the City of Austin electric utility department. After I graduated, I stayed with them and worked on the construction of a large coplant.

Q. And what did you do after that professionally?

A. After that, I found a position at the Lower Colorado River Authority.

Q. What is the Lower Colorado River Authority?

A. Well, if I need, the easiest way to describe the Lower Colorado River Authority, it's like a mini Tennessee Valley Authority. So they have a large area in Texas. They manage the lower Colorado River in Texas, so the water resources. They did parks, community services.

But by far, the biggest part of their operation was the electric generation and transmission side of the business.

Q. How long were you with the LCRA?

A. 30 years.

Q. What sort of titles did you hold at the LCRA?

A. Well, when I started there, I was a project engineer. From there, I moved into a position that was fuels manager for all the fuels for the power plant.

From there, I went into the executive team as the executive manager of fuels acquisition and development, the executive manager of business planning, and then the executive manager of business development.

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Q. Can you describe some of your responsibilities at the LCRA?

A. Sure. So this slide lays out a high level of what I did at the LCRA. Obviously, as I mentioned, I was involved in the construction of electric generation assets that was on the coal side. And natural gas plants. I did fuel management for all of the electric generation assets, both gas, coal, and coal transportation.

After I got my MBA, I did corporate-level strategic planning and business planning for the company. That also evolved as deregulations started happening in the mid '90s. Working on policy issues relative to electric deregulation.

That work included sharing a task force for a national organization of large public power entities across the United States, focusing on policy issues related to electric competition and deregulation.

And then towards the end of my career there, I worked on a large joint development agreement that involved the negotiation and the development of transmission assets in ERCOT.

Q. Can you give us some examples of projects you were responsible for at the LCRA?

A. Yes. So these -- the first ones were -- were essentially some of the stuff I did early in my career. The

FPP stands for the Fayette Power Project, which was a large coal plant.

I worked on a gas storage facility. Worked on gas pipeline acquisition and contracts. A fuel development project that involved surface mining.

Then, just before competition emerged, we did -- I was part of a team that did a joint development project with Calpine for a brand-new gas-combined cycle plant. And then after that, I negotiated a participation agreement in a large coal plant called the Sandy Creek plant.

And then, as I mentioned, the transmission project. Joint development agreement I did was with American Electric Power, and it added over three-quarters of a billion dollars to new assets to LCRA's rate base.

Right after I got my MBA, one of the projects I led was reorganizing the organization into lines of businesses and profit centers as a corporate strategy, so we -- we had different business centers that were around water transmission, electric generation, and such.

Q. And just to be clear, Mr. McCamant, did these projects require you to have an understanding of power grids?

A. It did.

Q. I think we're going to be talking lot more about ERCOT later, but can you tell me whether your 30 years of

work at the LCRA involved ERCOT?

A. Yes, ERCOT has been around since the early '70s. And so anything I did from work in fuels management, power plants, policy issues, transmission all would require a fundamental understanding of the operation with ERCOT.

Q. After 30 years at the LCRA, what -- what next professionally?

A. Well, when I was considering early retirement, I spoke to several trusted colleagues who all encouraged me to start doing some consulting, and that's when I formed McCamant Consulting.

Q. Do you have any connection with either BearBox or Lancium, other than your work on this case?

A. I do not. The only other connection would be my -- my knowledge of Lancium being involved in the ERCOT stakeholder process, because of their work there. And I have a colleague that I've known previously that became a consultant helping Lancium with that.

Q. Have you discussed this case with your colleague that now works for Lancium?

A. I have not.

MR. HORTON: May it please the Court. I'd like to proffer Frank McNamara as an expert witness in the filed of electric utilities, utility management, and electricity markets within ERCOT.

MR. KAUFMANN: No objection, Your Honor.

BY MR. HORTON:

Q. Mr. McCamant, I'd like to talk about some basics of an electric grid. Would people refer to an electricity grid by other names?

A. Sure. They call it a power grid, smart grid, or just a plain grid.

Q. Can you explain for us, what is an electricity grid?

A. Well, an electric grid is an interconnected system of generators, transmission, and consumption that has to be managed for it to work properly and be reliable.

Q. Have you used this graphic to maybe explain some of the basics?

A. Sure. So on this graphic, on the far left you essentially have something that represents generation, so that would be the power plants on the system that are producing electricity. They are connected by wires to the transmission system, which is shown by the large tower in the middle. It's essentially the bulk carrier of the power from the power plants out to the grid.

The transmission system is then connected by wires to a distribution system, which you typically see in your local neighborhood. That's then delivering by wires the electricity to the point of consumption represented by a house in this graphic.

Q. Does consumption of electricity have to be houses?

A. No, it can be factories, businesses, schools, churches, anything that is using electricity.

Q. Is there a term you would use more generally to describe consumption of electricity?

A. Yes, we typically call that "load."

Q. And all of these pieces are interconnected?

A. Yes, this is all an interconnected system.

Q. And how are they connected?

A. By wires.

Q. And electricity moves through the wires?

A. Correct.

Q. How fast?

A. Instantaneously.

Q. How do all these interconnected pieces stay organized?

A. Well, they have to be managed by an operator to keep it running correctly.

Q. And what is an operator?

A. Well, we use the term "independent system operators" or ISOs, they are essentially the managers of the grid. These independent system operators are going to be in areas that have been deregulated, where there's retail electricity choice. They manage the -- the system of generators offering their power into this deregulated system.

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And so typically an ISO would refer to a single state in the United States and then the other term we use is regional transmission operators or RTOs and typically those refer to a multi-state region.
Q. And can you explain for us what's going on in this graphic?
A. Yes, so this is a representation of the ISO and RTOs in America. And so you can see on the far left, we've got California in purple. So that's the California ISO. At the bottom of the graphic you can see the Electric Reliability Council of Texas.
On the far right here in Delaware RTO is the PJM Interconnection.
Q. And what does an ISO exactly do to keep the grid organized?
A. Well, it's creating and managing markets. It's working with market participants. It's administering and revising protocols and operating guidelines. And to do the balancing that's required on the system, they have to have a set of balancing tools.
Q. And do you have a graphic that illustrates that balancing concept?
A. I do.
Q. Can you explain this graphic please?
A. Sure. So here we have a balance scale. And it's

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just showing the balance between demand and supply, with demand being the load we've talked about or the consumption we've talked about. And the supply being the power generated.
And so these have to stay in balance for the system to operate correctly. And the way the operator balances that is by monitoring the system frequency, which is represented in the middle there by the 60. And that is representing 60 Hertz. And 60 Hertz essentially is a number that ties back to the number of revolutions per minute that a generator shaft is turning on the system.
And so if we have more supply than demand, then the system frequency will rise. And vis versa, if we have more demand than supply, the system frequency will drop.
And so a good analogy of that would be thinking of your car. If you have a car with a stick shift and it has RPMs that you monitor also, and so if you -- if you don't shift correctly, let it spin up too high RPMs, you run the risk of damaging that engine. And vis versa, if you don't shift correctly and let it overload the engine, you tend to run the risk of it stalling out.
So the grid is essentially a big machine.
Q. And how does an ISO achieve this balancing with the machine?
A. Well, it has a -- it has a set of products that it

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has to do that called Ancillary Services.
Q. Is there a particular ISO that you'd like to talk about today?
A. Yes, the Electric Reliability Council of Texas or known as ERCOT.
Q. And can you explain a little bit about how ERCOT balances supply and demand.
A. Sure. The same way that I mentioned for ISOs in general, they manage the wholesale market in the region. They work with the various market participants to get that done. They administer and revise market protocols and operating guidelines and then they have market products that serve as these balancing tools or Ancillary Services.
Q. And can you tell us a little bit about the market participants?
A. Sure. So on this graphic if we look at the upper right there in the middle and kind of the brownish box, is ERCOT. So that represents the entity of ERCOT. The two boxes above it are essentially entities that have some oversight of ERCOT, the independent market monitor and the public utility commission.
But if we go then over to the left, we'll see there's a box that has the letters QSE in it. And that stands for a qualified scheduling entity. And it's essentially the intermediary that kind of works between

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ERCOT, the consumption and the generators.
The consumption side being shown here on this graphic at the far left with the letters LSE which stand for load serving entity. And then there's also below the QSE is an arrow going to a graphic that looks like kind of an industrial power plant. And that represents something called a resource entity.
And so the resource entity is essentially the generators, the resources in the market. And those resources not only have to be generators, but they can also be load resources. And so -- and then the rest of the graphic on the bottom essentially mimics the graphic that we walked through earlier.
So you've got the transmission with TSP, the distribution with the DSP and at the very end, the house that represents the load or consumers.
Q. And you mentioned markets within ERCOT.
What are the different markets within ERCOT?
A. Well, there are two markets within ERCOT. The first one up here is called the Day-Ahead Market or the DAM. And it's a financially binding forward market that's voluntary so you -- it's not mandatory. You can participate in it if you want to.
And as it says Day-Ahead, it's a 24-hour period before the start of the operating day when the electricity

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is actually consumed. And the Day-Ahead Market settles a fixed price for electricity for the 24 hours of the next-day or their operating day. And so it settles that price for -- not only for energy, but also for Ancillary Services.

Then the next market is the Real-Time market. And that's essentially where the Real-Time price of -- excuse me, of electricity is generated. And that is updated by ERCOT every 5 minutes through their dispatch system. That dispatch system is based on the economics of demand and supply. And the reliability needs of the system to meet that demand. And it's dispatched at every 5 minutes.

Q. You mentioned that ERCOT markets have balancing tools.

What are those?

A. That's what I referred to as Ancillary Services.

Q. And do you have an analogy that you like to use for Ancillary Services?

A. Well, yes. So we think of Ancillary Services as being an obligation for providing something the next day or like a capacity reservation for what's needed the next day.

And kind of a simple analogy would be like a parking lot. So if a business was going to have a parking lot, they would typically size that parking lot for their busiest day, let's say Black Friday. They want to make sure they have enough spaces for their customers on Black Friday.

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But the rest of the year, other times, that parking lot has a capacity that may or may not be used by customers.

Q. Can you tell us about the different types of Ancillary Services?

A. Sure, in ERCOT, there's four basic Ancillary Services, and I'll speak about them just a little bit.

So the first two are regulation up and regulation down. That's kind of what I call the fine-tuning of load and generation in Real-Time as load fluctuates and maybe generation fluctuates to keep those in balance. Then ERCOT will use reg-up, reg-down to manage those kind of regulations.

The third one there called "responsive reserves" is kind of a larger reserve on hand for ERCOT to take care of things like if a power plant trips off the system and all of a sudden you've lost this generation and the frequency dip ERCOT would call on responsive reserves to manage that decay of frequency.

And then the last one here is called non-spinning reserves, so it's another type of reserve that ERCOT has on hand. And it's mainly there to deal with fluctuations, say, in the load forecast.

If the load forecast ends up being lower than what actually happens in Real-Time, then they can call on those reserves to keep the system in balance.

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Q. And how long have Ancillary Services existed within ERCOT?

A. They've been in place since the creation of the competitive market in ERCOT in 2000.

Q. In talking about your background you mentioned demand response.

What is demand response?

A. So demand response is a way for consumers to participate in the market if they can reduce or modify their consumption and respond to instructions or signals from ERCOT. And so for demand response, I've listed here the three different types ERCOT.

First, you have voluntary demand response and that's essentially where load can voluntarily reduce their consumption if they're exposed to Real-Time pricing. And so if they don't want to pay a high price, then they'll voluntarily reduce their consumption.

The second one is ERS, emergency response service. Again, it's a type of reserve that ERCOT has on hand. It is not a Day-Ahead or ancillary service product. It's a seasonal product, so it's something that ERCOT can uses as it says in emergencies when needed.

And then the last one is LR, referring to load resources. And that's kind of the -- kind of the largest area of demand response in ERCOT.

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Q. Before we get to the bullets, does demand response have anything to do with Ancillary Services?

A. Yes, there are some different load resources that can participate in Ancillary Services.

Q. Okay. And it looks like you've got four bullet points here. Can -- and it looks like it's maybe an example of a demand response scenario, can you explain that?

A. Yeah, so this is going through how would a load resource participate in an ancillary service market. And so the first step would be to submit an offer to ERCOT. All recourses have to submit their offer to ERCOT to participate in the ancillary service market.

So that offer has to include a power amount. So in other words, for load, how much are they willing to drop their consumption or curtail their consumption.

It has to include a specific time, what hours in the day -- in the operating day do they want to offer that power amount. And then what's their price point for doing it or their economic point for doing that.

Q. And is that price point -- if the offer is accepted by ERCOT, that's a fee that ERCOT pays?

A. Well, it's a revenue that they get from ERCOT if they're awarded.

Q. After the load resource offer, then what happens?

A. Well, then ERCOT takes all the offers and clears them

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through their market clearing system. And then awards who had the most competitive offers for that day, and if you're given award, you have an obligation to be ready to provide that service in the operating day.

So it creates an obligation, so for the load resource, if they were -- if they had an award for an ancillary service, they would have to be ready in the next day to be called on by ERCOT if needed to honor their offer.

Q. And does that obligation mean that they have to be using that amount of power that they submitted as part of their offer?

A. Well, yes, they wouldn't be able to curtail unless they were consuming that power.

Q. And what happens after the award?

A. Well, after the award, we go into the operating day, and depending on what happens during the operating day, ERCOT may need those Ancillary Services. And so ERCOT would issue an instruction if they needed that ancillary service and if the load resource received this instruction, they would be obligated to reduce their load or curtail their load in response to that instruction.

If there's no instruction from ERCOT, everything is operating fine, then the load would just continue to consume the power.

Q. Backing up to the award stage. After the load resource submits an offer and if ERCOT accepts and rewards, that's, then, an agreement between the load resource and ERCOT?

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A. Yes, I think you can characterize that obligation as an agreement, yes.

Q. After the third bullet, the instruction or no instruction, what happens next?

A. Well, the load resource, if the load resource had gotten an instruction to curtail, that load resource would have some power. In order to be consuming that power in the operating that day, they would have made some kind of previous arrangement in the market to have that power available to consume for their load.

And so if they received an instruction to curtail and their load went down, they would essentially have some unused power on their part during that time period that they could just turn around and liquidate or settle back into the Real-Time market.

If they didn't receive the instruction, they would just continue to consume that power that they made arrangements for.

Q. When you say "liquidate," is that the same thing as selling the power back?

A. They would sell it back. They would sell it back into the Real-Time market.

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Q. And when the load resource sells that unused power back into the market, do they get to keep the money from that?

A. They do, subject to any ERCOT fees, other things like that, yes.

Q. Going back up to the obligation, the load resource has an obligation you said to the -- using or consuming that amount of power that was included as part of the offer.

Does the load resource have to be using or consuming that power for any particular purpose?

A. No, it just needs to be using electricity.

Q. I'd like to come back to the QSE thing you mentioned earlier, but, first, when the unused power is sold back, is there a particular price at which it's sold back?

A. It would be sold back at whatever the Real-Time market price was at that particular point in time.

Q. Okay. Going back to the QSE, what is a QSE?

A. Well, a QSE is a qualified scheduling entity.

Q. And you said the QSE is like an intermediary, can you explain that?

A. Yes, so the QSE is essentially the -- the intermediary in the market, so it -- it works -- it's the one -- it's the only entity that can work directly with ERCOT for these kind of arrangements and for settling prices and for working with the load, and -- and also power plants.

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Q. How does a load become a Load Resource?

A. Well, there's a -- there's a process at ERCOT for becoming a load resource to participate in the market the way we described. It would need to register with ERCOT, it would need to be represented by a QSE to be able to participate in the market.

The registration process involves having an approved interconnection with the grid. It would need to submit the required registration documents. It would need to have installed the approved settlement meters for measurement and settlement in the market. And that's also established and approved data communication link with ERCOT.

Q. And who defines the Load Resource requirements?

A. ERCOT.

Q. Are these secret requirements?

A. No, they're publically available on the ERCOT website.

Q. And how long have Load Resources existed within ERCOT?

A. Well, in a way, Load Resources have -- have existed in ERCOT even before deregulation. But in terms of the way we're describing them here, they've been in -- in play since ERCOT was deregulated in 2000.

MR. HORTON: And if we could back up one slide.

BY MR. HORTON:

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Q. And how long has this demand response type of agreements and structure existed within ERCOT?
A. Since the introduction of competition in early 2000.
Q. How long does it take for a load to get qualified as a Load Resource within ERCOT?
A. Well, it could take a few weeks. It would really depend on how soon they were qualified within the specified qualification period.
Q. Is Load Resource qualification a rare event or is it pretty common?
A. No, it's fairly standard.
Q. Are Load Resources commonly known by any other names or acronyms?
A. Well, these type of load resources we've been talking about are -- are referred to as Non-Controllable Load Resources.
Q. And the amount of power that a Non-Controllable Load Resource submits as part of its offers and demand response, is there a particular quantity that they have to offer?
A. Yeah, it's for Non-Controllable Load Resources, it's a -- it's an on or off, all on or all off.
Q. So if there are Non-Controllable Load Resources, does that mean that there are Controllable Load Resources?
A. Yes.
Q. What is a Controllable Load Resource?

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A. A Controllable Load Resource is a -- is a Load Resource that can respond to instructions from ERCOT.
Q. And how is that different than a Load Resource?
A. Well, as we mentioned, a Load Resource is all on, all off. A Controllable Load Resource can participate in an additional part of the market where it can respond to 5-minute signals from ERCOT through the security constrained economic dispatch system, and thereby, kind of participate in different products.
Q. So can -- are Controllable Load Resources also known as CLRs?
A. Yes.
Q. So if I say CLR, you'll know what I'm talking about?
A. I will.
Q. Do CLRs participate in demand response programs like we talked about for Load Resources?
A. Yes, they would participate in the Ancillary Services that I have described.
Q. And would Controllable Load Resources have a similar limit on the amount of power that they can offer?
A. No, they can bid in or offer in for incremental amounts and be able to respond with incremental amounts.
Q. And how long have -- let's first talk about this, sorry.
The -- what does it take to be qualified as a

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CLR within ERCOT?
A. Well, there -- as you see here, there are some of the similar things that we talk about with Load Resource, in terms of being registered, having an interconnection. The main difference is they -- to quality, they would have to pass a performance test that would qualify their ability to do these incremental changes.
Q. And how long have CLRs been around within ERCOT?
A. CLRs have been around, again, since the early 2000s. Initially, they were part of the market. Conceptually, the -- the ERCOT competitive market started off a zonal market. It converted to a nodal market in 2010. And that was -- it was right after that CLRs are were fully implemented in the market.
Q. And do you have any experience with CLRs?
A. Yes. The -- the one customer -- one client that I mentioned, Consert, that was working on the virtual power plants. Part of my work with them was working with ERCOT on getting that virtual power plant product qualified as a CLR.
Q. And when was that CLR work for Consert?
A. That was -- that was in, like, the 2012, 2013 timeframe.
Q. And just to be clear, CLRs and their ability to participate in demand response, as we've discussed, has been around ERCOT for how long?

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A. Well, it -- it was implemented right after 2010.
Q. And, to your knowledge, who defines the CLR requirements?
A. ERCOT.
Q. And are these CLR requirements secret?
A. No. Again, they're available, publically available on the ERCOT website.
MR. HORTON: And if we could go back to the demand response slide, please.
BY MR. HORTON:
Q. And you mentioned that the demand response offer award instruction liquidate process for Load Resource is the same for Controllable Load Resource?
A. It is.
MR. HORTON: Thank you, no further questions.
MR. KAUFMANN: May I approach, Your Honor?
THE COURT: Yes.
Before you start, Mr. Kaufmann.
Let me just ask you a clarifying question. You said that Non-Controllable Load Resources means all on or all off.
THE WITNESS: That's correct.
THE COURT: And controllable, they can reduce their power consumption in some portion?
THE WITNESS: Incrementally, correct.

THE COURT: So when a Bitcoin miner goes all on to all off, is that considered controllable or noncontrollable?

THE WITNESS: Well, I think it would depend on what their strategy was on what products they wanted to go for. So if they were going to go all on or all off, they could be a noncontrollable resource.

If they -- if they wanted to -- I just think if they wanted to do all on, all off, they probably would just be a Controllable Load Resource.

The only thing that might change that, Judge, would be if they felt like -- so -- so the all on, all off is typically a responsive reserve product, if we think about the four Ancillary Services I had up there. And all these services have different price points in the market or value points.

And so if the -- if the load -- if the Bitcoin miner was trying to go after something that they felt like had more value than just the on/off ability in the market, then they may decide to do the CLR.

THE COURT: Okay. But, typically, if they are going from all on to all off, between, they are considered noncontrollable?

THE WITNESS: Correct.

CROSS-EXAMINATION

BY MR. KAUFMANN:

Q. Mr. McCamant, in a Load Resource -- a Non-Controllable Load Resource Ancillary Services, like you were just talking about, the decision to go all off is a decision that ERCOT makes for the Load Resource, right?

A. If the Load Resource has an award in the Ancillary Services, yes.

Q. All right. And, Mr. McCamant, you're not an expert in source code design, right?

A. I am not.

Q. And you're not an expert in mining cryptocurrencies, right?

A. I'm not.

Q. And you're not an expert in Bitcoin, correct?

A. That is correct.

Q. And you do not know whether or not cryptocurrency market prices are Real-Time prices, right?

A. Yes, I have no knowledge of that.

Q. And you have a rudimentary understanding of how datacenters operate but you're not an expert in datacenters that may be used to mine crypto cryptocurrencies, correct?

A. Correct.

Q. You did not review any patents as part of your work in this case?

A. I did not.

Q. You did not review or read the '433 patent when forming your opinions in this case, right?

A. I did not.

Q. And when you formed your opinions in the case, you didn't even know what the '433 patent was, right?

A. That's correct.

Q. And you're not offering any opinions regarding who invented the '433 patent, right?

A. That's correct.

Q. You're not relying on any patents for any of the opinions that you're offering in this case, right?

A. Can you repeat that first part -- you might want to get a little closer to the mike.

Q. You're not relying on any patents for any of the opinions that you're offering in this case?

A. I'm not.

Q. And you're not offering any opinions on the meaning of any terms used in patents in this case?

A. That's correct.

Q. And you've not read the prosecution history of any patents as part of your work in this case, right?

A. That's correct.

Q. Before you submitted your first report in this case, you had only spoken to Dr. McClellan once, correct?

A. That's correct. It was somewhere right around the

time when I was finishing up or submitting my report, somewhere in there.

Q. And you spoke to Dr. McClellan because he was wanting to speak to you because he had some questions about how power markets worked?

A. Yes, he had a question or two for me.

Q. And you only spoke to Dr. McClellan for 5 minutes or so, right?

A. Roughly.

Q. And it's fair to say that although you only spoke for 5 minutes, you don't recall what Dr. McClellan asked you?

A. I do not.

Q. ERCOT operates, you talked about, a Real-Time energy market, right?

A. Correct.

Q. And ERCOT operates an Ancillary Services market?

A. Right.

Q. Right?

And the ERCOT energy markets are different markets than the Ancillary Services markets, right?

A. Right.

Q. And as long as a load is qualified as a Load Resource with ERCOT, a load can participate in ERCOT's energy markets or the Ancillary Services markets, neither or both; right?

A. Right.

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Q. So if a load wanted to, it could participate in only the Real-Time energy market, right?
A. Correct.
Q. And if it wanted to, it could participate only in the Day-Ahead Market, right?
A. Correct.
Q. And a load could also choose -- or strike that.
I believe you said this earlier but ERCOT's Day-Ahead energy market is a voluntary financially-binding forward energy market, right?
A. That's right.
Q. And ERCOT's Day-Ahead Market is a market for buyer's and sellers of energy, right?
A. Can you say that one more time?
Q. ERCOT's Day-Ahead Market is a market for buyers and sellers of energy, of electricity?
A. Of energy and of Load Resources.
Q. I'm talking about the Day-Ahead energy market. That's a market for buyers and sellers of power.
A. Okay. True.
Q. Right. And if a buyer submits a bid for energy in the Day-Ahead energy market and that bid is accepted, the buyer is obligated to pay for that energy, right?
A. Say that one more time.
Q. If a buyer or a load submits a bid for energy in the

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Day-Ahead energy market and that bid is accepted, the buyer is obligated to pay for that energy, right?
A. I'm not quite following you.
Q. Well, you said the Day-Ahead energy market is a financial binding energy market, right?
A. Right.
Q. So buying energy in the Day-Ahead Market creates a binding agreement to buy the energy?
A. True.
Q. And so if a load buys energy in the Day-Ahead energy market, it has to pay for that energy, but it doesn't have to use the energy, right?
A. Yes, because it's buying that energy as a hedge against Real-Time Markets.
Q. So instead of using the energy it bought in the Day-Ahead energy market, a load could decide to sell that power back into the Real-Time energy market on the day that -- on the operating day where it received that power, right?
A. It could.
Q. And loads that purchase power in the Day-Ahead energy market can elect not to use some or all of that power, right?
A. Right.
Q. And if a load buys power in the Day-Ahead Market that

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they decide not to use, they can sell that power in the Real-Time energy market, right?
A. Yes.
Q. And I believe you said this, but if a load buys bower in the Day-Ahead energy market and doesn't use it and then sells it into the Real-Time Market -- energy market, that's called sellback, right?
A. It's a -- yeah. It's selling it back into the market or settling it in the Real-Time Market.
Q. Right. And so selling power in the Real-Time Market that you bought in the Day-Ahead Market is often called sellback?
A. True.
Q. And comparing the Real-Time energy market price to the Day-Ahead energy market price to decide whether to sell power back is something that was well known before May of 2019, right?
A. True.
Q. And buying power on the Day-Ahead Market and then selling that power back on the Real-Time Market, if there was a beneficial difference in price, is a type of energy arbitrage, right?
A. Right.
Q. Voluntarily curtailing consumption when the price of power exceeds a certain threshold is a form of energy

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arbitrage, right?
A. Yes.
Q. And in your opinion voluntarily curtailing of consumption when the price of power exceeds a certain threshold is the simplest and maybe most common form of energy arbitrage, right?
A. I would agree.
Q. Voluntarily curtailing of consumption when the price of power exceeds a certain threshold was well known -- was a well known form of energy arbitrage before May of 2019, right?
A. I agree.
Q. And you testified that there are four basic Ancillary Services, right?
A. Correct.
Q. That's regulation up or reg-up, regulation down, which is also called reg-down, responsive reserves and non-spinning reserves, which is sometimes called non-spin, right?
A. Right.
Q. And emergency response services or ERS is not an ancillary service, right?
A. That's correct.
Q. And within ERCOT or any ISO, the system capacity for generation needs to be able to meet the system demand for

power, right?
A. That is correct.
Q. This is the balancing you were talking about?
A. Yes.
Q. Supply of power has to equal demand for power, right?
A. Yes.
Q. And Ancillary Services provide capacity reserves to ensure that the system capacity meets the system demand for power, right?
A. Correct.
Q. And when trying to balance the supply of power with demand for power, decreasing the amount of power used has the same effect as increasing the amount of power generated, right?
A. Yes, so decreasing load is the same as increasing generation.
Q. And so if there's not enough energy on the grid to meet demand, there's two ways to balance the planned demand. You increase the generation of supply power or you decrease the demand or supply power.
A. That's correct.
Q. And Ancillary Services gives ERCOT the ability to decrease the amount of power being used, right?
A. Say that again, please.
Q. Ancillary Services give ERCOT the ability to decrease

the amount of power being used, right?
A. Correct, to the degree part of those Ancillary Services are supplied by Load Resources.
Q. So the Ancillary Services that Load Resources participate in give ERCOT the ability to decrease the amount of power being used, right?
A. Correct.
Q. And when ERCOT tells a load that it is providing Ancillary Services to use less power, that's called curtailing the load, right?
A. Correct.
Q. And the ability to curtail a load that's providing Ancillary Services provides a capacity reserve to allow ERCOT to balance supply with demand, right?
A. Can you say that one more time, please.
Q. Sure. The ability to curtail a load that's providing Ancillary Services provides a capacity reserve to allow ERCOT to balance supply with demand of power?
A. Yes, because Ancillary Services are essentially considered a capacity reserve.
Q. Right. So ERCOT procures the capacity reserves that are provided by the Ancillary Services in the Day-Ahead Market, right?
A. That's correct.
Q. I think you just said this, but ERCOT's Ancillary

Services market is a Day-Ahead Market, right? You submit your bid to provide Ancillary Services in the Day-Ahead Market?
A. That is correct.
Q. And in terms of terminology, the day for which an Ancillary Services award applies is called the operating day, right?
A. That's correct.
Q. So you submit an offer for Ancillary Services in the Day-Ahead Market, and if you're awarded, you provide the Ancillary Services the next day on the operating day?
A. That is correct.
Q. And if a qualified Load Resource is granted an award based on its bid in the Ancillary Services market ERCOT, it's obligated to perform in accordance with that award, right?
A. That is correct.
Q. And the Ancillary Services award in ERCOT includes time intervals for the award, right?
A. Correct.
Q. And the time intervals in an Ancillary Services award are specific hours in the operating day, right?
A. That is correct.
Q. And an Ancillary Services award for participating -- for load participating in ERCOT is the minimum amount of

power that the load has to use during the time period of the award, right?
A. Right. They have to be consuming that power in order to be ready to reduce it based on whatever their award was.
Q. And so if a load -- if a load resource is awarded and Ancillary Services awarded ERCOT, that award specifies certain time intervals in the operating day with certain megawatt requirements that the load has to provide capacity for, has to use that power, right?
A. Correct.
Q. And because an Ancillary Services award creates an obligation to use the amount of power specified in the award, a Load Resource that receives an Ancillary Services award cannot sell that power, right? It has to use the amount of power that's subject to the award, right?
A. Correct.
Q. And the Load Resource that's awarded an Ancillary Services award has to use that power that's subject to the award, whether it's profitable for them to do that or not, right? They're obligated to use that power?
A. Correct. They have to be ready to fulfill that obligation.
Q. And the way a Load Resource is compensated for providing Ancillary Services is through a capacity payment, right?

A. Yeah, essentially the award payment we've talked about.
Q. And the Load Resource gets that capacity payment whether or not ERCOT ever tells it to use less power, correct?
A. That is correct.
Q. So whether ERCOT curtails the load or not, they get the Ancillary Services capacity award?
A. Correct.
Q. Mr. McCamant, do you know Dr. Sham Siddiqi, who submitted an expert report for Lancium in this case?
A. I do.
Q. You've worked with Dr. Siddiqi?
A. Yes, I have in the past.
Q. And from your experience working with Dr. Siddiqi, you consider him to be a person of honesty and integrity, right?
A. I do.
MR. KAUFMANN: No further questions.

REDIRECT EXAMINATION

BY MR. HORTON:
Q. Mr. McCamant, under what kind of conditions would ERCOT exercise the option under a demand response agreement to curtail a load?
A. For Ancillary Services award?

Q. Yes.
A. It would be things like I mentioned before. If a power plant tripped offline and frequency dropped, they could use those Ancillary Services awards to recover frequency. And as we discussed earlier, a reduction in load is the same as increasing generation.
So essentially you would put more generation on to the system to recover that frequency drop.
Q. Is the ERCOT option being exercised for technical reasons then?
A. It's --
Q. Well, let me ask a better question: Is it being exercised for reliability purposes?
A. Reliability reasons, yes.
Q. Mr. McCamant, if I could have you pick up that binder there and take a look at TX983.
A. Which tab is it under?
Q. It should be a tab labeled --
A. I see it at the end. Yeah, I got it.
Q. Do you recognize this document?
A. Yes, it's my resume.
MR. HORTON: Your Honor, we'd like to move TX983 into evidence. And with that, we have no further questions.
MR. KAUFMANN: No objection, Your Honor.
THE COURT: All right.

MR. KAUFMANN: No further questions, Your Honor.
THE COURT: Okay. Let me just ask you a few questions.
THE WITNESS: Yes, Your Honor.
THE COURT: Just to clarify.
So load gets the option agreement from ERCOT, let's just say it's 20 megawatts, ERCOT doesn't necessarily issue curtailment instructions, the load gets the curtailment payment whether or not ERCOT issues the curtailment instructions?
THE WITNESS: That is correct.
THE COURT: Okay. So -- but the load has to be using the 20 megawatts unless ERCOT tells it otherwise?
THE WITNESS: That is correct. They're essentially being compensated to have that capacity available to ERCOT.
THE COURT: Okay. All right. Understood.
All right. Thank you.
THE WITNESS: Thank you. Am I done?
THE COURT: Yes, you may step down.
THE WITNESS: Thank you.
MR. HORTON: Your Honor, we don't know if the Court would like to take a break right now. We have two short deposition videos we'd like to play. And we also have the proffer that you requested.

THE COURT: Okay. All right. So let's -- the videos are of who?
MR. HORTON: Mr. McNamara and Dr. Cline.
THE COURT: Okay. Let's do that.
MR. HORTON: Okay.
Your Honor, the videos, collectively they are about 30 minutes each. Do you want to take a break now or go right into the videos?
THE COURT: Let's go -- we'll go until 4:10 and then we'll take a break and then we'll -- so --
MR. HORTON: That should be about right to finish the first video and then we'll take a break.
THE COURT: Yes.
MR. LABBE: The first one, Your Honor, is Michael McNamara and the BearBox time 29 minutes and 53 seconds, and the Lancium counter is at three minutes and 15 seconds, for the Court clerk.
THE COURT: Okay. So we'll finish that one and then we'll take a break.
Just so I'm clear, Lancium, Mr. McNamara, you intend to present him live in your case, right?
MR. LABBE: Correct, Your Honor.
(Video deposition played as follows:)
BY MR. HORTON:
Q. Could you please state your full name for the record,

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please.
A. Michael McNamara.
Q. So you founded Lancium in 2017; is that right?
A. Yes, that's right.
Q. Who is the cofounder with you?
A. Ray Cline is a cofounder, Prashan Gupta is a cofounder.
Q. So you founded Lancium in 2017. Do you recall roughly when in 2017?
A. Approximately the fall or the winter of 2017.
Q. What was the first point of business of Lancium after it was founded?
A. The company was founded to focus on stranded or excess energy for the purposes of Bitcoin mining or computing.
Q. Other than being a cofounder of Lancium, Mr. McNamara, do you have any other titles?
A. CEO.
Q. Mr. McNamara, I'm going to hand you an exhibit that I've marked as 36. The first page of that exhibit details the metadata associated with its capture from the internet. And for some reason it printed twice. But if you flip the page, do you recognize this document?
A. Yes, I do.
Q. What is this document?

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A. It is a press release.
Q. Did Lancium draft this press release?
A. I do not recall if we drafted it or if our outside comms firm did.
Q. But it was released by Lancium?
A. Yes, that's correct.
Q. And what is this press release announcing?
A. With fifth patent, Lancium powers ahead in fast-ramped datacenter innovation.
Q. And what is that fifth patent?
A. The U.S. Patent and Trademark Office awarded Lancium the patent number of 10,608,433 for methods and systems for adjusting power consumption based on a Power Option Agreement.
Q. Is Lancium profitable as of today?
A. Do you mean on a forecast basis or on a trailing basis?
Q. Let's start with a trailing basis?
A. No.
Q. So Lancium has yet to make its first dollar of profit?
A. On a quarterly basis, that's correct.
Q. But you're expecting profit soon?
A. Could you define "soon"?
Q. When are you expecting profit?

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A. We run numerous forecasts, some of which per district profitability in a year, some in three to five years.
Q. I'm going to hand you an exhibit marked 38. This is an e-mail chain.
Mr. McNamara, I'd like to direct your attention to the bottom of the page marked with the number that ends in 33743.
A. The bottom of the page?
Q. Yes. Do you see an e-mail from Jon Cohen to Todd Wilson?
A. I do.
Q. Who is Jon Cohen?
A. Jon served as our VP of finance and CFO for the period, I believe, 2018 through 2019.
Q. But Jon sent this e-mail on Friday, May 10, 2019; is that right?
A. Yes, I see that.
Q. And then if you travel up the e-mail chain to May 14th -- this is at the bottom of page that ends in 33742 -- do you see that Todd Wilson of Calpine writes back and says: "Gentleman, as you may know, Calpine Energy Solutions decided some years back that we were going to focus solely on risk management of our clients portfolio."
Did you understand that Todd was softly rejecting your inquiry?

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A. If I recall correctly, the feedback Todd gave me directly was that Calpine, as primarily a generator, would not do demand response because they believed demand response programs were in direct competition to their generation profile.
Q. But Mr. Wilson was kind enough to introduce you to Jay Young of Strategic Power Solutions?
A. Yes, that's right.
Q. And who is Jay Young?
A. Jay Young is a consultant, I believe. And I do not believe Strategic Power is it on QSE, but he would consult industrial clients on demand response programs.
Q. And what happened after you were introduced to Jay Young? It looks like you maybe set up a meeting?
A. I believe it was a meeting or a phone call. I don't recall. It looks like it was a phone call.
Q. And what did you discuss on that phone call?
A. I have no recollection of the phone call.
Q. Did Jay Young provide you with some information about ERCOT's demand response programs?
A. I believe Jay Young circulated a flier or brochure about demand response at ERCOT.
Q. And after receiving that information from Jay Young about demand response programs at ERCOT, was Lancium interested in participating in those demand response

programs?
A. We continued our conversations with jay.
Q. There was some level of interest.
A. Yes.
Q. As part of those conversations with Jay Young, did he introduce you to a QSE?
A. I believe Jay introduced us to MP2.
Q. And MP2 is a qualified scheduling entity?
A. Yes.
Q. Did he introduce you to anyone specific at MP2?
A. I believe it was Tim Carter, who is a customer representative there.
Q. And from that point, did Lancium begin working with MP2 on various demand response opportunities within ERCOT?
A. Yes, that's right.
Q. And to the best of your recollection, was that in the May-June 2019 timeframe?
A. It would have been throughout the course of 2019, yes.
Q. Did Lancium eventually sign up with MP2 as part of a demand response program within ERCOT?
A. Yes, we did.
Q. Mr. McNamara, I'm going to hand you Exhibit 39. This looks like an e-mail from Tim Carter at MP2 to you, copies Jay Young at Strategic Power and Ms. Arndt at Lancium. Does

that look right to you?
A. Yes, it does.
Q. And do you recognize the attachment to this e-mail?
A. Yes, I do.
Q. Is this the first services agreement that was entered into between MP2 and Lancium?
A. As far as I can recall.
Q. Mr. McNamara, I'm going to hand you an exhibit marked 40. This is titled "Electricity Sales and Purchase Agreement Between Calpine and Lancium."
It's got an addendum date of August 14, 2019.
Do you see that at the top of the document?
A. Yes, I do.
Q. Do you recognize this document?
A. Yes, I do.
Q. Is this sort of the deal we've been talking about?
A. Yes, I agree.
Q. If I could direct your attention down to the bottom of that first page, ending in 28482, under section 4.2, which is entitled "Monthly Settlement"?
A. Yes.
Q. Below that, section 4.2.2, that states: "During any settlement interval, if buyer's usage is less than the contract quantity, seller shall credit buyer's account by an amount equal to the deficit quantity multiplied by the

Real-Time price for energy as determined by ERCOT at the delivery point."
Do you see that?
A. I do see that.
Q. What do you understand that to mean?
A. I would characterize this as the seller of the load shall be able to capture the delta between the Real-Time price and the contract price to the extent there's a deficit quantity of power consumed in that time period.
Q. And it looks like your contract price was $34.62 per megawatt hour?
A. Yes, I do see that, for energy.
Q. And would it be the case, then, that if the Real-Time price per megawatt hour was higher than $34.62, under this agreement, Lancium could reduce its load by some amount and sell the difference for the Real-Time value?
A. Yes, that's right.
Q. Mr. McNamara, I'm going to hand you an exhibit marked 41. This looks to be an e-mail from you. Do you see that?
A. Yes.
Q. Do you recognize this e-mail?
A. Yes.
Q. It says: "We have a fixed-price power contract with Calpine at Thomas Road for about $34 per megawatt hour."
Do you see that?

A. Yes.
Q. Is this talking about the Calpine addendum you just reviewed --
A. Yes.
Q. -- as Exhibit 40?
A. Yes, that's right.
Q. You said: "This is cool. We now have two revenue sources: Bitcoin mining and selling power back to the grid."
Do you see that?
A. Yes, I do.
Q. And, again, that's referring to the Calpine deal where you could curtail the load and sell power back if the Real-Time price of that power was higher than your contract price?
A. Yes, that's right.
Q. And if I could turn your attention to the attachment, which was an Excel file. There's a slip sheet that says it's produced in favor of Lancium.
It's marked Bates number 0008305. The next page you see that document.
Do you recognize that document?
A. Although I don't have any individual recollection, I see it's a format that I would normally use.
Q. So you believe this is an Excel file that you created

Q. I actually think -- the question I'll ask is it may have been a group effort, but you were certainly involved in the preparation of this?
A. Yes, that's a fair characterization.
Q. And you provided this to Jay Young to give him an overview of Lancium as a company?
A. Yes.
Q. And I'm going to hand you Exhibit 49 which we begins on 28485. I'm sorry, if you can keep this together for the court reporter later, that would be great. Thank you.
Do you recognize this presentation as well?
A. Yes.
Q. And you're the author of this presentation?
A. While the template may be my authorship, but I do not recall who the primary yes to be of these don'ts it may well -- could have been me.
Q. If I could turn your attention to page 28496?
A. 28496, yes.
Q. The slide is titled: Discussion New Thomas Road Power.
Do you see that?
A. I do see that.
Q. And there's a red dotted box titled new on the right side of that slide?
A. Yes, I do see that.

Q. There are two columns inside that new box. Could you tell me what those mean?
A. I see a column demand response and a red box with yellow words that say negative nine per megawatt hour. A dollar sign should be there, but we can take its meaning. And power arbitrage with a box which says negative five per megawatt hour.
Q. On this slide, what is -- demand response minute mine megawatt hour, what is that referring to?
A. Think the reduction of the delivered power price achieved by demand response enrollment.
Q. Would this reflect your enrollment of Thomas Road in the LR and ERS demand response programs within ERCOT?
A. Yes, I would think so.
Q. And the power arbitrage minus five megawatt hour, what is that referring to?
A. That would be selling the high-priced hours against our fixed-priced block.
Q. As reflected in the Calpine addendum, correct?
A. With the fixed-price block, price and Real-Time settlement language as per the addendum, yes.
Q. You see the date of this document in the upper right-hand corner as August 19, 2019; is that correct?
A. I do see that.
Q. And I'm going to hand you Exhibit 52. And Exhibit 52

begins on page LANCIUM21608.
A. Yes.
Q. It's the e-mail from Raymond Cline to you October 10, 2019. Do you see that?
A. Yes, I do see that.
Q. Do you recall this e-mail?
A. Not in particular, but I remember at the time there were a number of discussions underway.
Q. A number of discussions involving the subject matter of this e-mail?
A. The subject matter contains Thomas Road facility, construction demand response, and other things. Yes, I remember all these.
Q. Mr. McNamara, I'm handing you Exhibit 54, which begins on page LANCIUM0001464.
A. Yes.
Q. Do you recognize this e-mail?
A. Yes, I do.
Q. What is this e-mail?
A. This is a forward of an e-mail that Mr. Storms sent to me, that went to Eric Kutscha, our head of engineering; Jon Cohen, our CFO; and Dr. Cline.
Q. Was Dr. Cline the Chief Technical Officer at that time?
A. He was Chief Computing Officer.

Q. And you write: "We met this guy at the Fidelity conference. He seems very confident, but his box is very expensive, though."
A. Yes.
Q. I direct your attention to an attachment for this e-mail that begins with the page number that ends in 14652?
A. Yes.
Q. It's a document produced in native format that's -- but it's an Excel file. You can flip the page and look at the Excel file please.
Do you recognize this attachment?
A. Yes, I do.
Q. What is it?
A. It's a spreadsheet, unformatted, that Mr. Storms has attached to the e-mail.
Q. Mr. McNamara, I'm handing you Exhibit 56.
A. Yes, I see it.
Q. Do you recognize this document?
A. It is the Layer1 claim chart that was prepared, I believe, in late 2020.
Q. Did you assist in the preparation of this claim chart?
A. Yes, I did.
Q. And you approved this claim chart in its final form prior to its filing with the Federal District Court in the

strike and our motion in limine number one.

THE COURT: Well, the motion says strike -- struck the supplemental expert report. That -- we struck that. And we said that Dr. McClellan cannot testify inconsistent with the Court's claim construction.

MR. KAUFMANN: Yes, Your Honor.

THE COURT: I'm not so sure I went so far as how you're characterizing it now. But let me hear from plaintiffs' attorney response.

MR. HORTON: Yes, Your Honor. Thank you. That's exactly what I was going to say is we didn't think that the Court's words went that far. We understand that the supplement is out. We intend to introduce testimony -- testimony and opinions from Dr. McClellan that are supported by his original reports only, and deposition testimony asking him questions about those original reports.

And so, that is -- that is all we intend to do.

THE COURT: All right. So Dr. McClellan can't come to trial now and give new opinions that aren't supported by his original report.

MR. HORTON: That's correct, Your Honor.

THE COURT: You understand that?

MR. HORTON: Absolutely.

MR. KAUFMANN: Your Honor, if I may. You know, part of our concern about these slides as well is the

analysis that is apparently provided on these slides we don't believe is in his original reports, so this is also new opinions.

To the extent plaintiffs assert that this is in his report, we'd ask them to identify where there's an explanation. You know, for example, on slide 3.34, there's a discussion of a 31-kilowatt power interval in the CSV file.

Your Honor, I can point to the supplemental report where Dr. McClellan discusses that, but there's no analysis in the opening reports explaining, not just taking the position that a minimum power threshold is disclosed, but explaining how it's disclosed.

MR. HORTON: Your Honor, copies of the reports if you'd like.

(Court reporter clarified.)

MR. RICORDATI: Ray Ricordati.

With that specific slide, you can see that Dr. McClellan has circled certain rows and values in the spreadsheet. He described that exact -- those exact rows in his original report.

THE COURT: At?

MR. RICORDATI: At -- it was at paragraph 62, I believe. Or I'm sorry -- here we go.

It's in paragraph 178. It says: "In addition,

BearBox also provided a comma-separated value file that described various monitored conditions, including Bitcoin price, Bitcoin block height, Real-Time LMP data head, LMP and estimated network hashrate" --

(Court reporter clarified.)

MR. RICORDATI: "Data head LMP and estimated network hashrate and a network difficulty.

This propriety CSV file also described or explained how to determine a generated mining revenue figure to be expected from using power to mine Bitcoin, a Real-Time LMP revenue figure based on selling energy to the grid at the current real-time energy price, a Day-Ahead LMP revenue figure based on selling energy to the grid in the future at the Day-Ahead energy price and a realized revenue figure that represented profitable of the three revenue figures. In some instances the most profitable option was to mine Bitcoin, see example, row two.

Well, in other instances the most profitable option was to sell energy to the grids, the example row seven and cells K7 and L7.

MR. KAUFMANN: Your Honor, if I may, our concern is not the discussion of what the spreadsheet does in the abstract, it's the comparison and opinion on how that relates to the claim language and supports conception.

Your Honor, paragraph 178 of Dr. McClellan's

report is not discussing claim elements. His analysis of the claims is much earlier. For example, the claim element at issue, receiving power option data, his report includes paragraph 61 through 64 is the total of his opinions -- or his analysis under that claim element.

And, Your Honor, there's no explanation in that portion of his report of how -- of the -- how the documents disclose a minimum power threshold and the power option agreement as Your Honor construed them. That is our concern.

It's the analysis of how the -- the spreadsheet and the documents allegedly support conception of the claim language and the comparison of that evidence to the claims.

MR. RICORDATI: Your Honor, I would say that that's a misrepresentation of the report. Just after that paragraph 178, you can see the claims are analyzed again with respect to the documents that were communicated from Storms to Lancium.

And Claim 1 starts right at the bottom of that page, continues on through the next -- through 61. And that that's the analysis of where that -- the functionality he described. And the documents communicated by Storms to Lancium establish conception and communication of the inventions in the '433 patent.

THE COURT: Okay. --

MR. KAUFMANN: Your Honor, could I ask what paragraphs.

THE COURT: Tell me those paragraphs again.

MR. RICORDATI: Sure, it's -- it would start from -- starts at 181 through paragraphs 192.

THE COURT: Okay. I see that.

MR. RICORDATI: You can see right after 178 and 179, Dr. McClellan stated: "In my opinion, the information provided by BearBox to Lancium would have enabled a person of ordinary skill in the art to make and use the invention recited in claims 1 through 20, either by its explicit description or because it was described in such detail that only ordinary skill was required to modify the information to arrive at the claimed invention."

MR. KAUFMANN: Your Honor, again, in that portion, paragraphs 187 and 188 that relate to claim element 1(c) about receiving power option data, including minimum power threshold under the Power Option Agreement, Your Honor, in those two paragraphs there is no explanation of how any of this evidence relates to the claim terms as Your Honor construed them. There is a conclusion that things are disclosed, but there's no comparison of that claim language.

And importantly, the issue, Your Honor, is that there is no explanation and analysis of how that discloses a power option agreement, as Your Honor construed it, and a

minimum power threshold, as Your Honor construed it; like in your ruling on the motion to strike where you found there is no explanation of how the evidence supports a system that meets the terms as Your Honor construed them.

MR. RICORDATI: I'd offer that in paragraph 188, Your Honor, the first sentence says: The information communicated by BearBox described this aspect of Claim 1 at least because the system calculated profitability at distinct time intervals, each with an associated power threshold, such as comparing mining profitability based on current power usage and energy price conditions on the one hand with profitability-based inter alia on expected future power usage and energy priced conditions.

That's the exact behavior that he described in the spreadsheet.

THE COURT: When I look at paragraph 195, it talks about BearBox communicated information described in the system comprising a received power option database at least in part on the Power Option Agreement, wherein the power option data specify one, a set of minimum power thresholds and, two, a set of time intervals for each minimum power threshold and the set of minimum power thresholds is associated with the time interval in the set of time intervals.

MR. KAUFMANN: Yes, Your Honor. Respectfully,

all that paragraph is saying is that he's repeating the claim language from earlier claim elements without explaining how any of this evidence demonstrates a set of minimum power thresholds or receipt of innovation under a power option, as Your Honor construed it.

Your Honor, that is our concern. He's offering conclusions with no explanation based on the wrong understanding or interpretation of the claim terms, as Your Honor found when, in response to our motion to exclude his opinions, their response was to submit a new opinion or a new report purporting to explain how his opinions were consistent, because that explanation is not in this report.

It offers conclusions that claim terms are found or -- that the evidence discloses claim limitations without the why, without the explanation. And, Your Honor, that analysis is what is prejudicial to us.

Because we didn't -- when we deposed Dr. McClellan, he provided an understanding that was inconsistent with the plain and ordinary meaning of the claims. Your Honor construed the terms inconsistent -- or his -- construed the terms in a way that is inconsistent with the way he applied them.

And so any explanation now of how the evidence supports the properly construed claims is -- are new opinions that are in here that we haven't had the

opportunity to explore in discovery, have our experts respond to. We're going to be hearing that analysis for the first time while Dr. McClellan is on the stand.

MR. RICORDATI: All of the evidence, like I said, is supported either by the original report, the reply report, or it has deposition testimony that we can cite to.

THE COURT: Okay. So -- so I'll -- I'll hear the testimony under advisement, take it conditionally under advisement. You'll have an opportunity to cross-examine him. If you show that these are, you know, new opinions, you know, I mean, I'll be able to ultimately -- even if I don't exclude it, I'll be able to determine what weight I give to it.

MR. KAUFMANN: Yes, Your Honor.

MR. RICORDATI: Thank you, Your Honor.

THE COURT: Yeah, can we -- so we're not going to hear the testimony today, but this evening, can plaintiffs map each slide to a paragraph in Dr. McClellan's report?

MR. HORTON: Yes, Your Honor. We'd be able to do that, sure.

MR. NELSON: Can you provide that to us as well, Ben?

MR. HORTON: Of course. Your Honor, by what time would you like to have that?

APPEARANCES:

ASHBY & GEDDES
BY: ANDREW C. MAYO, ESQ.

-and-

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DARRICK HOOKER, ESQ.
For the Defendants

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PROCEEDINGS

(REPORTER'S NOTE: The following trial was held in Courtroom 6-B, beginning at 9:30 a.m.)

THE COURT: Good morning.

ALL COUNSEL: Good morning, Your Honor.

THE COURT: You may be seated.

All right. So the Court has reviewed the parties' submissions regarding Dr. McClellan and the Court is going to allow Dr. McClellan to testify. We're going to take it -- we're going to allow him to testify on a conditional basis.

Based upon my review thus far of the parties' submissions, BearBox was able to cite to places in his expert report that arguably you can find some basis in his opinion for.

But, with that said, let me tell you that what I am clear on is that -- a couple of things.

Dr. McClellan was previously of the opinion that the load, not the power entity, held the option in the Power Option Agreement that Dr. McClellan was previously of the opinion that a load was not required to use the minimum power threshold. And that thus he, in his opening report, in his reply report, did not explain how BearBox's system

operated by maintaining a minimum amount of power, a load you must use during associated time intervals; i.e., the minimum power threshold as defined by the Power Option Agreement.

So, I wanted to clarify those things so that even if, you know, as I told Lancium yesterday, you'll have an opportunity to cross-examine. And to the extent that you believe that Dr. McClellan is testifying inconsistent with his prior -- his original report and his reply report, you should cross-examine him to point that out.

And in the end, you know, I think this goes to credibility as opposed to admissibility, so those are the confines that the Court gives the parties on that issue.

So with that, are we ready to begin?

MR. RICORDATI: Yes, Your Honor.

THE COURT: Okay.

MR. RICORDATI: Plaintiffs call Dr. Stan McClellan.

(Dr. McClellan, having been sworn, testified as follows:)

MR. RICORDATI: Your Honor, may I give a brief transitional statement?

THE COURT: Yes.

MR. RICORDATI: Dr. McClellan is a professor in the Ingrim School of Engineering at Texas State University

in the electrical and computer engineering program.

He's here today to testify about Mr. Storms' conception of the inventions recited in the '433 patent and his communication of those inventions to Lancium as well as Lancium's reaction to that information.

DIRECT EXAMINATION

BY MR. RICORDATI:

Q. Would you please state your name for the record.

A. Stan Dr. McClellan.

Q. Dr. McClellan, did you prepare some demonstrative slides to accompany your testimony today?

A. Yes.

Q. Before we begin, I'd like to direct your attention to TX19. It should be in your binder.

Do you recognize this document?

A. Yes.

Q. What is it?

A. It's my CV.

Q. Where do you currently work?

A. I work for Texas State University.

Q. What do you do?

A. I'm a professor in the Ingrim School of Engineering at Texas State. I was -- I'm also the codirector of a large-scale industry initiated called the connected infrastructure initiative. As well as the director of a

situation like that so you end up with a heat disparity in the racks. You have racks of computer systems and gangs of racks of computer systems. And the other is heat disparity and differential performance degradation.

And so we came up with the idea that the racks could be intelligent and the racks could communicate with the computer systems. And the racks and PDUs and the racks could all talk to each other with the amount of power that was being consumed and the state of the computers.

And they could also communicate with the floor and the PDUs for the gangs of racks and for the entire datacenter and manipulate the way that the cold air was being provided to the computer systems to cool them down more effectively.

And in that process, it became obvious to me that that communication could be done on the power line itself.

But Hewlett-Packard was not interested in this, so I left Hewlett-Packard, continued experimenting with these kinds of technologies. And developed an approach that actually worked.

So I started a small company called -- it eventually became to be called Power Tagging Technologies, that commercialized a two-way communication system that worked at low frequency directly on the power grid itself.

This technology was funded initially by the National Science Foundation, several million dollars from the National Science Foundation for the purposes of commercializing the technology.

Thereafter, multiple tranches of funding from Dominion power, which is the fourth largest energy service provider in the United States. As well as Lockheed Martin because there were homeland security implications as well as military implications of this ability communicate in this fashion.

It turns out that the technology also -- at the time we weren't aware, but the technology was also valuable in a fundamental grid activity, which is distributed voltage optimization. So after we developed a functional prototype that showed that the technology could work effectively for distributed voltage optimization, the company was consumed, by Dominion power and that technology is now in existence in a subsidiary of Dominion called DVI which focuses on DVO.

So the communications technology happens in real-time and bidirectional directly on the service provider's wires.

Q. So in total then, how long have you worked on smart grid devices?
A. About 20 years.
Q. Did you earn any patents for the technology you developed at Power Tagging?

A. Yes, at Power Tagging filed several patents, some of which I was involved in, some of which I was not.
Q. How many times have you rendered expert opinions in patent matters?
A. Um, probably about 20 separate cases.
Q. How many times have you been deposed?
A. Probably about ten times.
Q. How many times have you given testimony in trial?
A. Once before this.
Q. Was that a patent matter?
A. No, that was a wrongful injury matter.

MR. RICORDATI: Your Honor, plaintiffs offer Dr. McClellan as an expert in electrical and computer engineering, including smart grid technologies.

MR. KAUFMANN: No objection, Your Honor.

BY MR. RICORDATI:
Q. First, were you provided a legal standard to apply for conception?
A. Yes.
Q. What standard did you apply?
A. As described on the slide, conception is the completion of the mental part of the invention. The problem is composed in the mind of the inventor. Approaches for solving the problem are -- are potentially tried out. And

the invention has to be able to be reduced to practice by someone who is not -- did not have that thought, right. Did not have that conception.
Q. Any other standards you applied?
A. Yes.
Q. What?
A. Oh, any other?
Q. Yeah, standards -- what other standards?
A. Well, the -- the idea is that in conception, enough work has to be done so that someone skilled in the art can pick up where that started and continue. And as a result of that, the conception has to be corroborated by evidence of design.
Q. I'd like to talk a little bit about the definition of person of ordinary skill in the art that you applied in the case. What was that definition?
A. In my opinion, ordinary skill in the art in this case is a bachelor's degree in a technical field, such as electrical engineering, computer science or similar, which would include, like, engineering, technology, physics, and so on.
Q. Are you aware of Dr. Ehsani's definition of a person of ordinary skill in the art?
A. Yes.
Q. And do you agree with that definition?

And you can see in the top right a picture that some of the devices are on, reporting on as green and off as red.

Q. After Mr. Storms worked on his PDU, based on your review of the documents, what did he do next?

A. Well, after you developed the -- or sort of coincidentally or in coordination with the development of the PDU, he developed software to control it remotely.

Q. I'd like to direct your attention to TX24.

A. Yes.

Q. Have you reviewed this document?

A. Yes.

Q. What is it?

A. This is Python code written by Mr. Storms that performs -- the entirety of TX24 is a simulation or a prototype that performs all the activities of controlling the PDU, interfacing with various network elements and so on.

Q. All right. I'd like to -- how does the source code in TX24 operate?

A. Well, the -- the piece that's on the screen there is lines one through 18 of the Python code. Lines one through nine start by importing functionality from other packages. This is a common -- this is common in the -- in the use of Python, it's also common in other programming languages where you access libraries of code that are developed by

someone else or by yourself and prepackaged to simplify some of the source code that you're currently developing.

Following down from that, line 11 shows the -- the use of one of those imported functions to disable a network warning. And then lines 13 through 18 show the initialization of various variables that are used later in the simulation to -- to gait tasks or provide information for other tasks.

Q. What does -- directing your attention to line 15, what does the variable miner_hashrate represent?

A. Miner -- miner_hashrate shows that it's composed of three factors. The first factor, the 14 -- the large number is the number of hashes per second that an individual miner could complete. The 272 is the number of miners that's in the entire system. And the 0.95 is a -- is a margin factor to undercut the amount of power estimated to be used by the miners in order to remove the potential for an over -- overestimation.

Q. What does -- on the next line, what does the variable KW_load represent?

A. KW load is the estimated amount of power that would be used by those miners when they were in operation. 1.3 is the -- is the amount of power consumed by an individual miner, 272 miners. And 1.05 is the margin factor, the 5 percent margin factor to overestimate the amount of power

that would be consumed for stabilizing the system.

Q. So just to be clear, is that amount of energy produced by a single -- or consumed by a single miner?

A. Pardon?

Q. Is that the amount of energy consumed by a single miner?

A. No, both miner hashrate and KW load are talking about the aggregate of the system with all the miners in operation.

Q. What does the variable block_reward at line 18 represent?

A. Block -- block reward set to a value of 12.5 is the amount of Bitcoin that you would be awarded for successfully mining in the period prior to about May of 2020.

Q. What happens next in the code?

A. The subsequent lines of code from about line -- that's what's displayed on the screen from about line 20 to -- it actually goes through lines 112, defines functions that are going to be -- or methods or modules that are going to be repeatedly used throughout the simulation to perform specific -- to -- to create specific outcomes.

The first one, line 20 through about line 26 is a module or a function call or a module or a method named get BTC price. As you can see in the line 22, it requests -- from a remote URL it request as price. So it's

retrieving a data structure and it's calling that data structure "price."

And it's manipulating that data structure and retrieving an element out of that data structure that it's assigning to the variable RTC_price. And then RTC_price -- or BTC_price -- sorry, BTC_price is then the value that's returned back to whoever called that function.

Q. And what does --

A. The use of the function would be call BTC price so that it will give me back a BTC price value that's retrieved from the network.

Q. And what does the b -- BTC_price variable represent?

A. Bitcoin price at that time.

Q. Moving on to line 31, what is that module defining?

A. Yeah, lines 31 through it looks like 39 or 40 define another method called get_network_difficulty. If you notice that these modules don't accept any arguments, that's why they have the -- the empty parenthesis at the end of them.

So all they do is retrieve some information and hand it back to whoever asks them for it. So get_network_difficulty, it creates an instance of a raw proxy. A raw proxy is a function call that came in through one of the imported modules earlier.

So you can see that the P equals raw proxy in line 33 is -- is similar to how all these functions would be

Q. I'd like to talk about line 105.
Can you explain the condition that is being tested at that line?
A. The condition there is looking at the return value from the read of the PDU devices. So it's using the modbus protocol to read values from the remote PDUs that are at -- whatever the IPs are configured -- the numbers are configured.
So R equals client.readcoils, that uses the method read coils from the instantiated modbus client to return data in the variable R. And the variable R is a data structure that contains a bunch of different values and it's looking at the bits elements of the data structure R. And it's checking to see the value.
And it's doing that 24 times. And if all of those are true, then it turns the PDUs on. So it's checking to see if the PDUs are off. And if they are off, it's turning them on.
Q. If all the PDUs are not off, what will happen with the -- how will this code behave?
A. Well, it will skip over that step.
Q. You mentioned that the modbus client function uses a PDU IP address.
What is that?
A. You can see that in line 103 config.PDU.ip or

config.PDU.port. To communicate -- using internet protocol to communicate with a remote device, you have to know the address of the device. That's the IP number. And in addition to the address of the device, you have to know what's called a port. The port is like a service number on that device.
So the address identifies the node and the port identifies the type of service.
Those values would have been previously set up in a static value -- in a static form.
Q. What kind of benefits could you obtain by using IP protocols to address a PDU?
A. What kind of what?
Q. What kind of benefits would you receive by using --
A. Well, IP networking is -- was specifically designed to function over any kind of network infrastructure. So you can address -- by using IP -- by using, the TCP/IP or the Internet suite of protocols, that type of networking functionality can function over any type of physical network infrastructure at any distance.
Q. I'd like to go back to the previous slide.
So you earlier explained that KW load represents the entire -- or the output of 272 miners.
Why did Mr. Storms use -- in your opinion, why did Mr. Storms use the 272 -- or the 272 miners?

A. I don't know why he used the 272 miners. I think that maps -- mates up with the container that he was using, the PDU functionality that he was able to design, and so on.
Q. Based on your review of the other documents, did the 272 number of miners equate to -- or did his system have more or less than 272 miners?
A. Well, his software could address any number of devices based on the structure of the PDU. It can address them individually, it can address them in groups, it can address them all at once.
So this -- the functionality in this simulation was addressing all of them at once, turning them all on, turning them all off.
Q. Why would -- why would you want to turn them all on or all off?
A. That's -- that's a typical sort of stress test or system validation test. You want to make sure you can do all of them. You want to make sure you can do all of them and manage their states correctly. And that's consistent with the other development that we saw as well with the graphical user interface where you can test the functionality that's at a different scale, right.
You individually tests whether you can talk to each one, whether you can talk to them in groups. And then in the simulation, where you're kind of stress testing the

entire system, you deal with all of them at once, because you're looking for best case, worse case kind of analysis.
Q. How does the code in TX24 turn the PDUs on and off?
A. So these -- these other pieces of code are defined in the beginning of the simulation as modules that are reused several times. As you -- you've seen the way that they are used previously.
So, again, it's reimporting this module here. The reason -- the reason it's reimporting at this point is both good and bad, is because every time this code is called it's going to stop for a minute and it's going to try to figure out if that's been done. So that stuff on line 73 and again on line 83 is going to cause a delay, so that's why I call it the kind of sloppy or naive coding.
But it also serves a purpose to make sure that the -- before you try to use those functions, they are actually defined. So there's -- this -- this -- in an actual commercial implementation, this would have been done in a very different way.
So this is an indication that this is prototype or proof of concept kind of work. But it does the same sort of thing, right, it imports the -- from the -- from the pi modbus module, it imports TCP client, which is a particular type of network connection -- network transport connection.
It creates an instance of the client, it uses

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the right coils method of the client at line 75 to -- to write the off command -- or to write the on command to all the units. So the false times 24 actually repeats that thing 24 times and causes a connection. Similar with PDU, all off lines 81 through 89, same idea except the right value is different.

Again, this is an interesting example of kind of an experimental or proof of concept or an I'm not exactly sure I know what I'm doing here kind of an implementation because this is inefficient.

MR. RICORDATI: If we could just zoom in on lines 13 through 18 of TX24. Thank you.

BY MR. RICORDATI:

Q. So we talked about this earlier, that KW_load represents the total power usage of the entire system. Approximately what is that value?

A. KW_load?

Q. Yes.

A. It's 1.3 kilowatts times 272 miners with a fudge factor of 5 percent; it's roughly 31 kilowatts.

Q. For the hour?

A. Yeah.

Q. Or for the -- okay.

A. I mean, I don't remember what the actual number is. If you multiply that out, it's 1.3 times 272 times 1.05.

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That's the total load of the system. That's more like 373. That's the total load of the system, sorry.

Q. And then if we could go back to lines --

A. That 373 is the number that's shown on the data sheet.

MR. RICORDATI: If we could go back to lines 63 through 67.

BY MR. RICORDATI:

Q. And so when the -- in line 116, when the KW_load variable is divided by 12, approximately what is that value?

A. KW_load divided by 12 converts to 373 in 5-minute increments is just out 31-kilowatt. So the system -- the system with all miners on would consume about 31 kilowatts for five minutes.

Q. All right. I'd like to direct your attention to TX47.

A. Yes.

Q. Have you reviewed this document?

A. Yes.

Q. What is it?

A. This is one of the definitions of one of the other modules that we've seen -- one of the other function calls that we've seen used. Which -- which based on the location at line 7, the location is passed in, and the get real-time LMP function -- the get real -- based on that -- based on

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that location that's passed in at line 7, the get real-time LMP function reaches out using an -- the URL outlets defined there retrieves some data, parses that data, saves that data, and then writes that data into a database.

You're going to have to zoom in on it to see it better.

The stuff in the -- the stuff in the blue box there shows the URL of the power market defined, right. It's a -- it's a link that shows that it's RTBM LMP by location pass. So that's a -- that's a web-based interface to retrieve a CSV file or a collection of prices.

You can see at the end of the URL, it says SL-latest interval.CSV. So it's asking that location it's asking that location for that file. And then based on that file that comes back, you can see that in the -- in line 12, the request.get asks that URL that's defined for that file and returns that file in the variable data.

So the variable data is a data structure that essentially contains the CSV file. And then the -- the line on line -- on line 14, it's using the -- it's using the library pandas, which is a two-dimensional, three-dimensional data manipulation library in Python that's very popular.

It's using the pandas library to read that CSV that's been returned on line 14, and it puts that in what's

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called a data frame. So line 14 interprets the data that's received from the URL in CSV form, reformats it into what's called the data frame, and the name of that data frame is DF.

And then in line 17, DF -- the -- that data file is rewritten as the file name data.CSV by the pandas data frame.

Q. And then directing your attention to TX47.

MR. RICORDATI: Get rid of the zoom.

BY MR. RICORDATI:

Q. It's line 31 -- or I'm sorry -- yeah, line 31.

A. And so the data that's contained in that data frame is all the real-time pricing information associated with the location that was given.

And so out of the -- out of the data table that was created using that -- or it creates the data table or it validates the fact that the data table was there. Out of that data table, it retrieves the real-time LMP price on line 32 and 33 -- actually, 31 through 33.

31 shows the SQL command to retrieve the -- the value, and 32 and 33 show the conversion of the value to a floating point number scale by 1,000. And it closes the connection to the database at line 40.

And then the value RT LMP that was computed or retrieved on line 33 is then returned to the caller.

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talking about.

For an industry-grade system, you would have a single device with two power feeds and this PDU can control the dual outlets and the control of that can be done remotely.

The third bullet says all network infrastructure on UPS/battery backup, so it means the entire system contains some network infrastructure which would be necessary to talk to it remotely. And it has an uninterruptible power supply or batteries to create a backup in case the power goes out.

And the fourth bullet shows that it consumes about 373 kilowatts when everything is running.

Q. And on to the next section.

Or, actually, let's skip ahead to the section entitled "Total Designed Hashrate."

What is described there?

A. Yeah, total designed hashrate is the sixth main bullet on the section. It shows that the complete system can contain 272 miners, each one at 14.5 terrahashes per second. And that's a sum total of 3.9 terrahashes or a large number of computations per second. And it uses S9 miners.

As you can see at the top of the data sheet, at the top title line, it talks about Bitmain S9j, Dragonmint,

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T1 or similar. So it's talking about the use of those kinds of miners and 272 stuck in a box and how much outcome you would get from that.

Q. What do those values represent?

A. That's the amount of work I can get out of that infrastructure.

Q. What is the value indicated in the diagram or document?

A. It's 272 miners, each being able to do an amount of work of 14.5 terahashes per second. So 272 times 14.5 is the aggregate 3.9.

Q. What does the pH per second indicate?

A. It's a large number of hashes per second.

Q. So, Mr. Storms' system could do a lot of calculations?

A. Yeah, Mr. Storms' system is a -- is a collection of application-specific computing devices whose job is to produce one type of output, which is hashes. And it can do that very, very well.

Q. Okay. Moving on to the section titled "Network."

A. Yeah, the main bullet below that talks about the network connectivity of the box full of the 272 miners. It says it has Cat 5e Ethernet, which means that it has cabled Ethernet inside the box to connect the miners together.

Cat 5e is just a type of Ethernet cabling. It

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says it has 48-port unmanaged switches, gen3eric Ethernet switches so that the network connection would be connected to the switches, the switches would be connected to the miners through some cabling.

And the third bullet says it has on-site WAN or satellite, so it has some uplink or backhaul capability.

Q. Okay. Moving on to the section titled "Software Management."

What would a person in the ordinary skill in the art understand this section to describe?

A. The software management bullet talks about the software capabilities. So the first bullet says "local cgminer watchdog." I think we've looked at that already.

We may not have looked at that, but it's a local piece of software that makes sure the miners are functioning.

The second bullet talks about a database for miner login. We've seen when in the code that we've looked at previous when the data is retrieved from the marketplace, it's written into a database. When calculations are made, they are written into a database.

The third bullet talks about PDU/relay mapping for full automation. So what it means is that the ports of the PDU, the down stream ports of the PDU are mapped to relays so that they can be turned on and off. This is the

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remote addressing of the PDUs to turn individual miners on or off.

The next bullet says optional real-time breakeven monitoring, in parenthesis, the renewable marketplace data. That's the software that we looked at previously where it retrieves market data from the power network and computes the breakeven.

And the last bullet mentions SMTP e-mail alerts which we looked at previously in the software. When critical conditions happen, the system is -- the autonomous system alerts the human users or owners that those events have happened.

Q. Referring to the line, the optional real-time breakeven monitoring, do any of the other documents in TX157 explain this functionally?

A. The CSV file that was included in the e-mail certainly explains this functionality. The -- the picture that's on the other side or the pictorial discussion of the system mentions the retrieval of Day-Ahead and real-time pricing data from the market which would indicate some functionality associated with the pricing and costing.

Q. Okay. So let's move on to the annotated diagram on TX157.3.

A. Yes.

Q. What's described -- what would a person of ordinary

skill in the art understand this diagram to mean?

A. This is the flip side, what I would consider the flip side of the single-page, glossier data sheet that kind of provides a functional description of the system.

Starting from the bottom, the bottom is the box itself with the miners installed. The box is connected to a power system because you can't run miners without a power supply somehow.

That's the pipe. The pipe has directionality to it. It can be connected vertically to a generation source. It can also be connected horizontally to a power source. And the indication there is that the power source that it's connected to there is a power pool. Commercial or wholesale power, versus private power.

So private power is vertical, public power is to the right of the pipe.

Moving around the box, on the right-hand side of the box at the top, you see the antenna, the BearBox at the bottom. Right there you see the antenna which indicates the backhaul that was alluded to previously in the speeds and feeds. And to the right of the box, you see the outcomes of the process which is Bitcoin mining.

Moving vertically up the left-hand side of the box, you see some definition of capabilities. Above the lightening bolt you see that it can be generation assets.

There's some physical infrastructure. There's some hardware layer and soft management layer that's associated with the box.

To the right, top right of the brochure, it indicates control software that's controlling the box. It says software management. Has arrows that point to the bubbles that are color-coded.

The top purple bubble says "Python" so it indicates that the code that manages the box is written in Python. Python is an interpreted language which gives me some insight as to how the box functions. As opposed to a compiled language, which we'll talk about shortly.

In the Bitcoin core node indicates that the software connects to the Bitcoin core node. It implements some software functionality to be able to communicate. With that, the green -- down on the further on the left, the yellow blob, says LAN cgminer -- and I can't read it from here.

LAN cgminer watchdog with DB table login, which is what we just talked about. It performs -- it performs mining using the open source cgminer software analogs, the data.

The blue bubble in the middle indicates that there's a database that's central to all of this stuff. And the database can be local to the box, local to the control

system or distributed somewhere in some cloud. So this is a fully distributed system that can log itself and manage itself.

The upper green -- the upper green bullet on the right, or blob on the right says an "API for Bitcoin data," so it indicates that the Python code can communicate with the Bitcoin network and retrieve data.

The green bubble on the bottom right says custom PDU and fan control hardware and logic. So it indicates that the system has custom PDU and fan control logic and so on. Okay.

And then the bottom red bubble on the right says Day-Ahead LMP and real-time LMP data feed from a variety of market sources. The red bubble on the right corresponds with the two red bubbles on the left or it shows that the market information is being retrieved from the same entity that's providing the power that's going into the horizontal pipe.

Q. And referring back up to the upper green?

A. The upper green.

Q. The exchange API represents what again?

A. It says exchange API US D/Bitcoin data.

Q. And what does that represent?

A. That's retrieving Bitcoin information.

Q. What information specifically?

A. It's retrieving information about the -- the difficulty of the Bitcoin network, the pricing associated with the Bitcoin network and so on. So the top bubble, the top green bubble is a summary of the system. It says automatic miner management system.

Q. In your opinion, what would a person of ordinary skill in the art understand the -- the to represent?

A. Bitcoin is being produced by the system when it's in operation.

Q. In your opinion, what would a person of ordinary skill in the art understand the dollar signs to mean?

A. Money, money is -- revenue is being achieved, either by the -- by the Bitcoin mining that's being done or by some other means. Which may include selling back power or doing something else.

Q. Do any of the other documents in TX157 describe those two outcomes?

A. The CSV file that was included in the e-mail goes into substantial detail on the internal operations of the system. The CSV file that was included in the e-mail is essentially a dump of internal state variables of the software that provide insight into how the software works and what it optimizes.

Q. And just to be clear, when we talked about -- Bitcoin is a cryptocurrency, correct?

A. Right.
Q. And Bitcoin price is a cryptocurrency price?
A. Right.
Q. Does this diagram indicate any time intervals?
A. Yeah, on the -- on the bottom left, where it connects to the -- the -- the horizontal section of the pipe that connects to a power pool, it indicates hourly in 5-minute data retrieval from the market price of that power.
Q. And what does the lightening bolt indicate?
A. The lightening bolt indicates that there's some sort of arrangement between a power producing entity and the entity that controls the BearBox whereby power can be delivered to the BearBox.
Q. And why do you believe that reflects a relationship between those entities?
A. Well, because it talks about generation assets and the lightening bolt is indicative of power. And the only way to obtain power from some type of generation asset is to have some type of agreement with that generation asset to produce that power for you and so that you can consume it.
Q. Okay. I'd like to direct your attention to TX157.8.
A. Yes.
Q. What would a person of ordinary skill in the art understand this document to be?
A. Well, my interpretation of this document, as I've indicated previously, is a dump of the internal state variables of the control software. It shows in 5-minute increments what the software is thinking and the decisions that it's being -- that are being made at each of those 5-minute increments.
Q. Let's just kind of walk through the column headers and please explain what each column -- the data in each column represents?
A. Sure. The left hand --
Q. As a person in ordinary skill in the art.
A. Do you want me to go through or do you want to lead through it.
Q. You can go through them.
A. The left-hand column indicates Bitcoin price at that 5-minute increment, so that was retrieved from the Bitcoin network. That information was also retrieve -- also received along with that information was the block height, as well as a couple of other variables, the network hashrate and network diff.
So those elements indicate the difficulty of mining Bitcoin at that time as well as the reward for mining Bitcoin at that time.
Moving -- going back to the left-hand and moving to the left, the breakeven mining cost is the value it was computed previously was saw in the software. So the software computes the breakeven mining cost based on the amount of power that's consumed by the Bitcoin miners and the cost of the power that's being provided to the Bitcoin miners.
Q. And what -- what type of interval is associated with the amount of power that's used in that breakeven calculation?
A. Five minutes.
Q. Okay. Moving on to the next column.
A. The next column is the date and time that this information was retrieved or computed. The subsequent column --
Q. Before we move on, what -- can you -- what would a person of ordinary skill in the art understand that these values indicate?
A. Those values indicate 5-minute increments where every five minutes the values are being updated, re-retrieved, recomputed, so on.
Q. Okay. Moving on.
A. The next column to the right says Day-Ahead LMP, that's the value that's retrieved from the marketplace for the Day-Ahead Market at that 5-minute interval.
The next column to the right says Day-Ahead LMP rev, which is the amount of money that that power -- that the power that would be computed -- that would be consumed by these miners would cost using that day-ahead price.
The next column -- the next column to the right is network hashrate, we've already talked about that.
The next column to the right is mining_revenue, that's the amount of revenue that you would achieve by mining Bitcoin under those conditions during that 5-minute interval.
The next column to the right says network difficulty, we've already talked about that. That's a Bitcoin network issue.
The next column to the right is real-time LMP and it's companion column real-time LMP rev. Those are similar to the Day-Ahead LMP and Day-Ahead LMP rev except using a different price point, so the real-time LMP has a higher price typically.
Q. And --
A. The realized rev is the outcome of the optimization process or the control process that is being simulated here. The realized rev is the amount of revenue that you would achieve if you were performing the optimization calculations that the software is performing.
You can see that the value of realized rev, 2.69 something, is the same as the mining_rev column, 2.69 something. So that point, you're mining. For that five minutes you're doing mining and you're realizing the

revenue from the Bitcoin mining.

And similar for the next two or three columns. And then at -- down at column -- the next two or three rows. Down at the other row where it jumps all of a sudden to 6.67, you can see the 6.67 value in realized rev is the same as the 6.67 value in real-time rev.

So at that point, you would be selling power back to the -- back to the power pool using the real-time revenue value and not mining.

Q. Okay. So during -- just to be clear, during a situation -- or in a row where the realized revenue is equal to the -- an LMP revenue value, how much energy is -- how much energy would a person of ordinary skill in the art would understand is being used in that interval?

A. During a -- during the time where it was equal to the real-time LMP?

Q. Yes.

A. Well, that's the -- that's the value of the power that would have been being used for Bitcoin mining, but that power is instead redirected to the power pool. So the Bitcoin mining power consumption is zero or roughly zero at that point.

Q. What about the power consumption shown --

A. Under the conditions of the simulation that's described, the power consumption of the top four rows is the

amount of power that would be consumed by the Bitcoin mining device under those conditions at that time for those 5-minute intervals.

Q. So in your opinion, did the documents in TX175 explain the primary features of -- or I'm sorry 157, I misspoke there, explain the primary features of Mr. Storms' system?

A. Yeah. I mean, you can -- you can read between the lines here. I mean, if you -- if you divide certain columns' values by each other, you can discern the amount of power that the Bitcoin miners would be targeting to use in that 5-minute interval. If you look at the different changing values, you can discern what the control algorithms outcomes are.

Q. So my question is the -- the collection of documents that were e-mailed from Mr. Storms to Mr. McNamara in TX --

A. In brochure plus the -- plus the CSV file --

Q. Exactly --

A. -- they describe the system fairly completely.

Q. What major components do they outline?

A. They outline the ability of the system to mine Bitcoin or not mine Bitcoin. They outline the ability of the system to mine Bitcoin at a particular target. They outline the system -- the ability of the system to produce or to control the system at pretty fine grain from a remote

location.

They described the network communication abilities for the system, where it can receive information and communicate messages. We've seen SMTP messages that were communicated back, it can retrieve the information. It -- they described the -- the necessity of the system to be connected to some sort of power generation facility and act as -- and the ability of the system to act as a load for that power generation facility.

They describe the 5-minute intervals over which the system functions. The mining_revenue that indicates power utilization during that 5-minute interval. And the sell-back revenue that indicates a reduction in power usage for that 5-minute interval.

Q. So did you prepare any demonstratives to explain how the values -- or how the system as defined in the CSV file would actually operate if implemented?

A. Yeah, simply graphing the columns that are -- have the term "rev" at the end of them, you can come up with graphs that -- these -- these two graphs are just graphing the data that's in the spreadsheet.

Q. Okay. So let's -- let's start with the one on the left. If we can zoom in on that a little bit.

A. Yeah, that's the combined revenue, that's the -- that's the -- that's the several columns that are -- have

rev at the end of them, which you can see in the legend of the graph. Blue is the --

Q. Yeah, let's take the first one. Yeah, let's start with blue. And what -- what is that showing?

A. Blue indicates the Day-Ahead LMP revenue, which presumably would be the amount of revenue you would achieve by selling the power back at the day-ahead price.

Q. And approximately what type -- or what -- how much revenue was generated by selling at the day-ahead price?

A. The amount of revenue that's generated is the amount of power that was being allocated multiplied by the day-ahead revenue figure.

Q. And in this -- in this graph, what is that value showing as, approximately?

A. It's very small.

Q. Moving on to -- I think that's orange.

A. The orange or whatever color that is, mining_revenue, a really unfortunate choice of colors there, is the line that's kind of constant right there. It's constant, except for periods when something changes in it.

So the mining_revenue is relatively constant which indicates that the system is almost always on in mining Bitcoin. Except during times when it's not on in mining Bitcoin, which is based on the real-time LMP revenue.

So the green line is the real-time LMP revenue

associated with the power that would be consumed by the Bitcoin miners. And at certain points, the LMP revenue far exceeds the Bitcoin mining revenue, and so the realized revenue, which is the fat sort of red line tracks the maximum of the day-ahead LMP revenue, the mining_revenue, and the real-time LMP revenue.

In this particular case, the Day-Ahead LMP revenue never exceeds the mining_revenue so it doesn't show up under the fat red line. But the fat red line -- I mean, all of these lines are just directly graphing what's -- the data that's in the spreadsheet.

Q. And we can move on to the image on the right.

What's shown in that graph?

A. The graph on the right, this particular graph which is the graph on the right, shows a smaller portion of that same time interval. It's something like five, six -- it looks about an 8-hour, 9-hour period where one of the -- the first -- in the first ten lines there's an excursion where the real-time LMP revenue far exceeds. It jumps from 2.6 to 13 something, so you can see that graphically here.

And then it goes back down to its 2.6. So if you look at the values in the spreadsheet under mining rev, you'll see this same behavior.

The other thing of note, if you look at the previous graph, it covers multiple days, multiple 24-hour

periods.

Q. And did you prepare a graphic to indicated what the energy usage of the system would -- the overall energy of usage of the system would be using the values as defined in CSV file?

A. Right. With just a little bit of interpretation of the data in the CSV file, you can determine how much power would be used by mining versus not mining as well as when the mining happened. It's pretty obvious when the mining and not mining happened because of -- the realized rev changes.

So whenever the realized rev changes to correspond, the mining either is happening or not mining is happening.

So in the first few lines of the spreadsheet, mine is happening because mining revenue is getting transferred into the realized revenue column. And the amount of power that's being used at that point can be determined through the other data in the spreadsheet. It can also be determined through the data that's in the data sheet. It's about 31 kilowatts.

Q. And then after the real-time price spikes, how does the system respond?

A. When the real-time spike happens, the miners turn off. Or the miners would turn off. And they would be

consuming zero power at that point because you're selling that power back into the real-time Market at the higher price.

So the sell-back revenue indicates reduction in power usage for that interval, roughly the same amount of kilowatts, 31 kilowatts for that group of miners for that 5-minute interval.

Q. And then after the real-time price settles down to typical values, what happens?

A. After the real-time price is underneath the mining revenue price, then the system turns the miners back on and they continue mining. These graphs and this data is just interpretations of what -- direct graphs or slight computations of what's shown in the spreadsheet.

Q. Okay. I'd like to direct your attention to TX1.

A. Yes.

Q. What is it? What is this document?

A. This is the '433 patent.

Q. And have you reviewed this document?

A. Yes.

Q. What struck you when you reviewed the document?

A. It closely mirrors a lot of the capabilities that are described in the data sheet and the CSV file.

Q. Did you prepare a graphic to illustrate that comparison?

A. This slide here shows figure 11 taken from the patent as well as the diagram that was on the front of the data sheet. It also maps individual elements of figure 11 into individual elements of the diagram that was taken from the front of the data sheet.

You can see in the diagram on the right that there is a Bitcoin mining system that has different types of connections. Those elements are mapped directly back into named elements of the figure 11.

Q. And that corresponds to elements 1102, 1104 --

A. May I have a copy of that picture? I can't see the numbers.

Maybe zoom in on the number.

MR. RICORDATI: If we can zoom in on the diagram on the right.

A. There we go.

Looking at the three numbers kind of at the bottom center left --

BY MR. RICORDATI:

Q. Actually, it might be easier, you should have that on your screen as well.

A. Oh, yeah, I do.

I'm completely ignoring this screen over here and squinting at that.

On the bottom center left of the diagram, you

MR. RICORDATI: Okay. We can remove that.
MR. KAUFMANN: Your Honor, we request to strike the testimony of the last slide as well.
THE COURT: Okay. That's granted.
BY MR. RICORDATI:
Q. Okay. I'd like to move to the next slide.
Now, Dr. McClellan, in your view, did any of the claim terms in the '433 patent require construction when you did your initial analysis?
A. My understanding during the initial analysis is that the two sides had agreed that there would be plain and ordinary meaning applied to the terms.
Q. And since your report, you've been made aware that the Court has construed two particular claim terms, Power Option Agreement and minimum power threshold; is that correct?
A. Yes, I think that arose in my deposition where I thought it was kind of strange that there hadn't been a *Markman* hearing at that point.
MR. KAUFMANN: Objection, Your Honor. This was the issue of Dr. McClellan's supplemental report. It's the only place where he discusses the Court's claim construction which Your Honor struck.
THE COURT: Yeah, but this is just the Court's claim construction, right, so it's -- he -- this is just the

claim construction. So this demonstrative is fine.
BY MR. RICORDATI:
Q. Did the Court's constructions change any of your opinions?
A. No.
Q. Based on your review of Mr. Storms' system as of early May 2019, did you form an opinion as to whether Mr. Storms conceived of the inventions claimed in the '433 patent?
A. Yes.
Q. What was the basis for your opinion?
A. The basis for the opinion was the review of the patent claims, the patent claims, the filing history and the materials that were provided to me related to Storms' activity in developing the BearBox system as well as the simulation outcomes and so on.
Q. In your opinion, did Mr. Storms conceive of the inventions claimed in the '433?
A. Yes.
Q. Based on your review of Mr. Storms' system as of early May 19th -- early May 2019, did you form an opinion as to whether Mr. Storms communicated information disclosing the inventions claimed in the '433 patent to Lancium?
A. Yes.
Q. What was the basis for your opinion?

A. The basis for the opinion is the information that was -- primarily the information that was communicated in the e-mails, which includes the system architecture information as well as the CSV files with the state variable data.
Q. In your opinion, did Mr. Storms communicate the inventions claimed in the '433 patent to Lancium?
A. Yes.
Q. I'd like to start with Claim 1. The first section of Claim 1 recites a system comprising a set of computing systems wherein the set of computing systems is configured to perform computational operations using power from a power grid.
Did Mr. Storms' system -- or how did Mr. Storms' system satisfy this aspect of Claim 1?
A. As shown in the diagram, it describes a system that uses computational devices, Dragon, Bitmain S9, and so on. In the BearBox, the performing computational operations, which is Bitcoin mining, it can -- it shows that the BearBox had to be connected to some form of power system in order to operate.
Q. And does the information communicated by Mr. Storms to Lancium describe this aspect of Claim 1?
A. Yes.
Q. Where?

A. It shows that the BearBox system is composed of computing devices that are performing at an operation, which happens to be Bitcoin mining. And it shows that those devices are connected to a power entity.
Q. And does Bitcoin mining entail performing computational operations?
A. Yes.
Q. Okay. Moving on to the next limitation in Claim 1. Did Mr. Storms conceive of a control system configured to monitor a set of conditions?
A. Yes.
Q. How did Mr. Storms' system meet this aspect of Claim 1?
A. The system monitored conditions associated with the -- the power market. It also monitored variables associated with the Bitcoin network. And it made decisions based on those inputs.
Q. How do Bitcoin and energy price relate to this aspect of Claim 1?
A. Well, the Bitcoin miners are mining using energy that's being sourced from some power entity, so there's cost associated with that. And the mining that they produce is the result -- as a result of their effort has some value associated with the Bitcoin network.
Q. What conditions did Mr. Storms' system monitor?

A. According to this diagram, it monitored day-ahead pricing as well as 5-minute pricing for the real-time and Day-Ahead Markets of the power market.
Q. And your --
A. It also monitored Bitcoin pricing -- Bitcoin pricing and Bitcoin network metrics.
Q. And in your opinion, does the information communicated by Mr. Storms to Lancium describe this aspect of Claim 1?
A. Yes.
Q. Where?
A. Well, it shows that it's monitoring a set of conditions, and it shows that it has some sort of control system that can act on those conditions that are being monitored.
Q. Any other documents that show -- that were communicated to Lancium that showed monitoring conditions?
A. The CSV file also shows that. It clearly shows that the Bitcoin variables and energy prices were being monitored on 5-minute intervals and then the decision was being made based on those variables, so that's a control system.
Q. Okay. Moving on to the next limitation.
Did Mr. Storms conceive of a system that received power option data based at least in part on the Power Option Agreement, or in the power option data

specified a set of minimum power thresholds and a set of time intervals wherein each minimum power threshold and the set of minimum power thresholds is associated with a time interval in the set of time intervals?
MR. KAUFMANN: Objection, Your Honor, Dr. McClellan didn't offer any opinions of time with regard to the claim construction in these terms. That was the subject matter of his supplemental report that Your Honor struck.
MR. RICORDATI: Your Honor -- may I, Your Honor? Dr. McClellan is going to offer an opinion that Mr. Storms' system communicated power option data, including power thresholds and time intervals, and that the -- the Power Option Agreement agreement, as defined by ERCOT, in that system had been known.
And a person of ordinary skill in the art would have been able to apply Mr. Storms' system in the known context of ERCOT's, you know, 20-year-old Power Option Agreement relationship.
MR. KAUFMANN: Your Honor, "Power Option Agreement" is a term that's in the patent that Your Honor has construed.
THE COURT: You can cross-examine him about his definition of Power Option Agreement and show the Court how it's inconsistent with the patent. Again, it goes to

credibility not admissibility.
MR. KAUFMANN: Yes, Your Honor.
MR. RICORDATI: I'll re-ask the question.
BY MR. RICORDATI:
Q. Did Mr. Storms conceive of a system that received power option data based at least in part on a Power Option Agreement wherein the power option data specify, one, a set of minimum power thresholds, and, two, a set of time intervals wherein each minimum power threshold in the set of minimum power thresholds is associated with a time intervals in the set of timed intervals?
A. Mr. Storms' system operated in timed intervals, and those time intervals were provided with a power consumption target. And that corresponds with a power threshold to be consumed or not consumed by the Bitcoin miners during that time interval.
That data could have been associated with a Power Option Agreement, but Mr. Storms' system was a simulation, it did not enter into a contractual arrangement with a power provider to create what's -- what would be called some form of Power Option Agreement.
Q. So what type of power option data did Mr. Storms' system receive?
A. The data that's being communicated to the system -- or that the system is retrieving is the day-ahead data as

well as the 5-minute real-time Market price data.
Q. And those are the monitored conditions we discussed, right?
A. As well as the monitored conditions for the Bitcoin network and so on.
Q. What intervals was Mr. Storms' system configured to operate on?
A. Storms' system was configured to operate on 5-minute intervals to comport with, for example, ERCOT real-time pricing data. So it would have been compatible with the time intervals associated with the Power Option Agreement, if one had existed.
Q. Did Mr. Storms -- when Mr. Storms' system was mining, did it use power for the entire length of that interval?
A. Storms' system was configured to recompute the breakeven, retrieved the Bitcoin data, and retrieve the power system data at the beginning of a 5-minute interval.
And so it computed those -- that information based on the telemetry data, and it held the information for the remainder of the 5-minute interval until the next 5-minute interval where it redid those computations.
Q. Did anything about the way Mr. Storms designed his system relate to this aspect of Claim 1?
A. I'm not sure what you're asking.
Q. Based on your review of the documents, what power

Q. And does the -- does CSV file also show conditions being monitored?
A. Yes, the -- the -- the BearBox system as well as the data that was communicated shows the monitoring of conditions including Bitcoin variables and every prices.
Q. Moving on to Claim 12. Did Mr. Storms conceive of a system that satisfies the elements recited in Claim 12?
A. Yeah, the -- the elements of interfacing with a qualified scheduling entity such as in the ERCOT network are well known for many years before this. The requirement to create some sort of a business arrangement with a power network, with a power generation facility is well known.
And somebody in the ordinary skill in the art would have known that these things can be assembled. They are conventional features and would have been obvious.
Q. And how do you know that?
A. Because they're conventional features that are published publically.
Q. Okay. Let's move on to Claim 13.
Did Mr. Storms conceive of a system that satisfies the elements of Claim 13?
A. Yeah, Claim 13 depended on Claim 1 where it further -- provides further limitations that talks about subsequent time intervals. And power thresholds associated with subsequent time intervals. As we've talked about

before, the information -- the construction of Storms' system operated on 5-minute intervals and that information was communicated to Lancium at least in the spreadsheet or the CSV file where the 5-minute intervals are shown.
Q. Okay. Moving on to Claim 14. Did Mr. Storms conceive of a system that satisfies the elements of Claim 14?
A. Yeah, Claim 14 --
Q. I think it's all shown --
A. -- Claim 14 further customizes Claim 13 where a control system determines a performance strategy for the competing system where that performance strategy is comprised of a power consumption target during intervals, the power consumption target during subsequent intervals; and the first power consumption target and the second power consumption target during first and second intervals, they are associated with a threshold.
Storms' system was capable of doing this and that information was communicated to Lancium at least in the spreadsheet or the CSV file that shows power consumption strategy where the Bitcoin miners are instructed to mine or not mine based on the monitored conditions and the power target, which is the amount of power that would be consumed by the miners when they are mining or would be profited from in the sell-back.

Q. Okay.
MR. RICORDATI: Next slide.
BY MR. RICORDATI:
Q. Moving on to Claim 15.
Did Mr. Storms' conceive of a system that satisfies the elements of Claim 15?
A. Yeah, Claim 15 is dependant on Claim 1 where it talks about the system operating over subsequent time intervals that correspond to a 24-hour period. As we've seen in the CSV data that was provided by Storms to Lancium, his system operated over multiple 24-hour intervals and that was communicated.
Q. Okay. Let's move on to Claim 16. Did Mr. Storms conceive of a system that satisfies the elements of Claim 16?
A. Yes, Storms' system monitored -- included a control system that monitored conditions including the price of power from a grid from the market that's associated with an electrical grid and various parameters associated with a cryptocurrency network.
As we discussed previously, that's indicated in the diagram on the data sheet where the system is communicating with the power market as well as where the system is communicating and retrieving values from the Bitcoin network.

Q. Is that functionality shown in the annotated diagram?
A. Yes.
Q. Where?
A. The red bubbles that show where it's communicating with the power market and then it's capable of communicating with the power market. And the other bubbles that are associated with -- the green and orange sort of bubbles that are associated with communicating with the Bitcoin network and retrieving information.
So this was part of Storms' system and it was also communicated at least with the data sheet, but also with the CSV file that were communicated to Lancium where all those values were shown in various 5-minute intervals.
Q. Okay. Moving on to the next portion of Claim 16 it says: "Wherein the control system is configured to determine the performance strategy for the set of computing systems based on," and I won't finish the rest of the claim.
But based on the new information that was added --
A. Yeah, Storms' system was clearly able to do this and this was communicated to Lancium in the CSV file. The communication with the Bitcoin network to retrieve Bitcoin parameters, the communication with the power market to retrieve power market parameters, and the activity of using the amount of power associated with the Bitcoin miners to

either mine or not mine based on associated revenue.
Q. And then moving on to the last portion of Claim 16.
"Wherein the performance strategy specifies for at least a subset for mining operations for the cryptocurrency when the price of power is equal or less than revenue obtained by performing a mining operations for cryptocurrencies."
That's shown in the information that Storm's communicated to Lancium?
A. Yeah, Storms' system was capable of doing this, as we've discussed previously, and this was also communicated in the CSV file where the mining revenue indicates the determination of the performance strategy to mine or not mine based on Bitcoin network and power market conditions.
Q. Okay. Moving on to Claim 17.
In our opinion, did Mr. Storms conceive of a system that satisfies the elements of Claim 17?
A. Yes, Claim 17 is not -- doesn't contain any different substance than Claim 1, so everything we talked about with respect Claim 1 applies to Claim 17.
Q. So your opinion is also that Mr. Storms communicated information that described the elements recited in Claim 17 to Lancium?
A. Mr. Storms' system complies with the elements of the claim and those -- those elements were communicated to

Lancium, those capabilities were communicated.
Q. Okay. Next we've got Claim 18.
Did Mr. Storms conceive of a system that satisfies the elements of Claim 18?
A. Yes. As we've seen previously, Mr. Storms' system retrieved information from the computing systems, at least in the fact that the system was aware of the capability of different miners in terms of power consumption and computing output. And so, therefore, it identified that information.
It also had a cgminer watchdog that was local to the set of miners that managed those miners and retrieved information from them, including performance metrics of the last few seconds or last few minutes.
Q. And how -- did Mr. Storms communicate the -- the information described in this particular aspect of Claim 18 to Lancium?
A. The information in the data sheet describes the use of different types of miners in the system, so that's identifying information about the type of computing systems that are to be controlled.
Q. Do any other -- let's start with the product detail sheet on the left, TX157.02.
Does that indicate anywhere else that -- identifying information about the set of computers?
A. The bullets -- the bullet total design hashrate talks

about the characteristics of the miners so that's equivalent to retrieving information about the set of computing systems.
The cgminer watchdog to function would have to be retrieving information about the state of the Bitcoin miners.
Q. And are those aspects of Claim 18 also shown in the annotated diagram?
A. Yes, they are shown in the bubble that talks about the Bitcoin miners as well as the LAN cgminer watchdog.
Q. Moving on to the next portion of Claim 18.
Again, it's determining the performance strategy based on the modified information above. All right. You know what, I'll just read this limitation.
So the next aspect of Claim 18 says: "In determining the performance strategy to further comprise instructions for at least a set of the set of computing systems to operate at an increased frequency based on a combination of at least a portion of the power option data and the information about the set of computing systems."
Did Mr. Storms conceive of a system that satisfied this aspect of Claim 18?
A. Yes, Mr. Storms' system was capable of achieving this and he implemented that in his system. The system was able to operate at an increased frequency in terms of turning the

miners on and off because in his software you could change the period at which the miners were reoptimized. So it's a frequency of -- it would be equivalent to a duty cycle or frequency of reoptimization.
The cgminer software itself is capable of being tuned. In the computer parlance it would be called overclocking. So we can control the frequency of the processor that's running the Bitcoin miner.
Q. I'd like to direct your attention to TX830.
A. Yes.
Q. Do you recognize this document?
A. This is some of -- this is some of data that's associated with the cgminer open source project. This is the file that contains details about the cgminer remote procedural column, API.
Q. Is there a particular portion of the TX830 -- I'd actually direct your attention to TX830.6-7.
Do any of the information communicated in that document relate to cgminer's capabilities as we've you discussed?
A. Yes, this describes the RPC interface with the cgminer where you can set parameters associated with the Bitcoin miners remotely. You can change their operational characteristics. Those operational characteristics include the clock frequency of the CPU.

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Q. Moving to Claim 19.
Did Mr. Storms conceive of a system that satisfies the elements recited in Claim 19?
A. Yes, Claim 19 is not substantively different from a previous Claim 6 and 7 that describe the receiving of power data and the -- most of the section of 7. So the reasons associated with Claims 6 and 7 apply here, in terms of meeting both the claim limitations and communicating the information.
Q. And lastly, Claim 20.
Did Mr. Storms conceive of a system that satisfies the elements of claim 20?
A. Yeah, similar to the other independent claims, Claim 20 is not substantively different from Claim 1. So the analysis of Storms' system in comparison with the claim language is -- my reasoning for that equally applies here as well as the reasoning for communicating information to Lancium.
Q. Okay. Dr. McClellan, have you reviewed the -- just to be clear, does that relate to your opinion as to conception and communication to Lancium?
A. Right.
Q. Dr. McClellan, have you reviewed the expert report of Dr. Mark Ehsani?
A. Yes.

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Q. In his report, Dr. Ehsani alleges that Mr. Storms' system did not describe the inventions claim in the '433 patent.
Do you agree with that opinion?
A. No.
Q. Why not?
A. For several reasons. We have some slides to describe that.
It seemed to me that Dr. Ehsani read individual elements of data that were provided by Storms rather than reading all of them in completeness. And it also seemed that Dr. Ehsani was concerned more with commercial implementation of the system rather than invention of the system. And those two things are completely separate.
Q. How are those things separate?
A. You don't commercialize immediately an invention. You invent and then you go through a process of commercialization. So assessing something for inventiveness based on its state of commercialization is -- doesn't make sense.
Q. Any other things you disagree with Dr. Ehsani with his --
A. We've discussed -- we've discussed the use of the spreadsheet in what I would call form of reverse engineering, some of the logic behind Storms' system. The

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CSV file, which was provided, gives a -- as I've said it's a dump of state variables of internal operations of his simulation system. So it gives one a really good set of information upon which to embark on a reverse engineering exercise for what Mr. Storms' system did.
So that's pretty straightforward and we've kind of gone through that here.
As well as the existence of option agreements in the power markets. There are a lot of different option agreements in the power markets and they provide data associated with -- that's defined by that type of option agreement and which power entity it's being stroked with.
Q. I'd like to direct your attention to TX13.
A. Yes.
Q. Do you recognize this document?
A. Yes, this is the '632 application.
Q. Have you reviewed this document?
A. Yes.
Q. Now, Dr. McClellan, in Dr. Ehsani's report, he alleges that the '632 application discloses most if not all the same features as Mr. Storms, do you agree with that?
A. No.
Q. Why not?
A. Well, Dr. Ehsani's interpretation of the term "economic considerations" is extremely broad. Certainly,

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some economic considerations are what to do with Bitcoin, but that's not specific -- it's not specified in the '632 application. The only economic consideration taught or even suggested in the '632 application is using energy when it's available at a negative price or when you're losing money by using it.
So it doesn't mention Bitcoin, it doesn't talk about cryptocurrency or breakeven calculations or a performance strategy to instruct a set of computing systems.
Q. Just to be clear, you said that the '632 patent describes only purchasing energy when it's at a negative price; is that right?
A. Right.
Q. Doesn't explicitly describe any other economic consideration, does it?
A. I don't -- I don't think so.
Q. Okay. Now, in his report, Dr. Ehsani claims that -- that Raymond Cline had a supposed flash of insight that lead to conception in late August 2019 when he noted: "The quote, award received after offering into an Ancillary Services program and received as part of the establishment of the Power Option Agreement, (is essentially an) "obligation to our [Lancium's part] that we consume the amount of power that ERCOT could curtail."
Based on that, Dr. Ehsani argues that Mssrs.

McNamara and Cline are the sole inventors.
Do you agree with that opinion?
A. No.
Q. Why don't you agree?
A. That flash of insight occurred after discussion with Mr. Storms. That flash of insight was a realization that a contractual obligation had to exist.
Q. I'd like to direct your attention to TX -- here we go. It's TX107. Do you recognize this document?
A. Yes.
Q. And what is it?
A. It's an e-mail from -- 107. Yeah, it's an e-mail from McNamara to Cline, et al., that talks about a fixed price power contract at a certain location for a certain price.
Q. And what does the e-mail message indicate?
A. It indicates that -- well, it says: "This is cool. We now have two revenue sources: Bitcoin mining and selling power back to the grid."
Q. And what's the date on that e-mail?
A. August 16, 2019.
Q. Did Mr. Storms' system also have two revenue sources, Bitcoin mining and selling power back to the grid?
A. Yes.
Q. Did you compare any demonstratives to compare the

information provided in TX107 to Mr. Storms' --
A. Yes.
Q. -- the information that Mr. Storms communicated to Lancium?
A. Yes.
MR. RICORDATI: Can you -- one more. There we go.
THE WITNESS: Yeah, this slide compares the CSV file that was communicated by Storms to Lancium, at the top, with the spreadsheet described by McNamara a couple of months later, at the bottom.
The -- the elements of the CSV file and the elements of the spreadsheet that are common are highlighted in the same color. So starting from the left, you have the green highlighted Bitcoin price at the top, which corresponds to the green highlighted Bitcoin price at the bottom.
BY MR. RICORDATI:
Q. In the bottom, what row is the Bitcoin price in?
A. It looks like the second row it says fixed power price, power price, and then Bitcoin power price.
Q. So, just to be clear on -- when you referred to the -- in the upper portion of the diagram, the left column, Bitcoin price, that was TX157 that you're referring to?
A. Yeah, that's the CSV file provided by Storms.

Q. And when you referred to the bottom portion of the screen, you're referring to TX107?
A. Yes, that's the spreadsheet provided by McNamara.
Q. Okay. So what other comparisons did you notice -- or similarities did you notice between the two sheets?
A. The estimated hashrate that's highlighted in kind of orange in the top section in -- in TX157 corresponds to the global hashrate that's highlighted in orange in TX107 that's indicated as global hashrate.
The gray highlighted part in the column labeled mining_revenue in TX157 corresponds to the -- the row entitled "revenue per megawatt" on the left-hand side of bottom of TX107.
The purple in the top half that's in -- in TX157 that's describing real-time LMP revenue or real-time sell-back revenue is -- corresponds to the purple column of the bottom of the right-hand column that's under grid power revenue.
So the bottom spreadsheet has on the left-hand side computing revenue and on the right-hand side grid power revenue. And common to those grid power and computing revenue are the power price or the real-time Market price, which is highlighted in the spreadsheet above -- or in the CSV file above in yellow.
As well as the margin or -- the revenue achieved

through each one of those things, which is highlighted in the spreadsheet above in green, in the column realized revenue. And on the bottom section, the final line of the spreadsheet that talks about margin per megawatt hour for each of the categories computing revenue and grid power revenue.
Q. Dr. McClellan, have you reviewed the expert report of Dr. Mark Ehsani?
A. Yes.
Q. In his report, Dr. Ehsani alleges that Mr. Storms' system did not describe the inventions claimed in the '433 patent; do you agree with that opinion?
A. No.
Q. Why not?
A. We've -- we've discussed this several times. Dr. Ehsani makes --
Q. I'm sorry, we're talking about Dr. -- I'm sorry, I misspoke. Let's start these questions again.
Dr. McClellan, have you reviewed the expert report of Mr. Baer?
A. Yes.
Q. And in his report, Mr. Baer alleges that the Storms system did not -- the Storm source code specifically did not describe the inventions claimed in the '433 patent.
Do you agree with that opinion?

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communicated concepts and information. And those concepts and information were -- seem to me, to have been used in creating the verbiage and the terminology that's used in the claims in the patent.

MR. KAUFMANN: Can we pull up Dr. McClellan's deposition at page 176, lines 5-9.

THE COURT: Can we pause for a minute.

(Discussion between the Court and the Court Reporter was held off the record.)

BY MR. KAUFMANN:

Q. Dr. McClellan, at your deposition you were asked: "In certain dependent claims, they weren't -- BearBox didn't communicate that information, but in your view, those would have been obvious in light of what BearBox did communicate; is that right?

And you said "Yeah."

Right?

A. Yeah, that's exactly what I just repeated.

Q. You're not changing your testimony today?

A. No, that's exactly what just I repeated today.

MR. KAUFMANN: And could we pull up Dr. McClellan's testimony at page 175, line 20 through 176 line 4.

BY MR. KAUFMANN:

Q. And you also testified that: "I think there's some

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dependent claims that are not necessarily associated with the stuff that BearBox may have communicated."

Right, that was your testimony?

MR. RICORDATI: Objection. Incomplete.

BY MR. KAUFMANN:

Q. That was your testimony, right?

A. That section of testimony --

MR. RICORDATI: Can he read the rest of the answer?

THE COURT: He can.

BY MR. KAUFMANN:

Q. Dr. McClellan, you said: "There's three independent claims. I think there's some dependent claims that are not necessarily associated with stuff that BearBox may have communicated. But the independent claims and some of the dependent claims BearBox communicated information that would be enabling for Lancium to recite those claims."

Right? That was your testimony?

A. Yes, we'd have to look at the claims because some of the claims included things that would be obvious to somebody who is aware of the market and skilled in the art. So BearBox did not communicate those things such as a QSE. And a QSE is one in the dependent claims. So clearly BearBox did not communicate that a QSE exists. That's what that indicates.

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Q. And so BearBox did not communicate all the aspects of all the claims of the '433 patent, right?

A. BearBox didn't communicate things that were inherently obvious.

Q. Your opinions that Mr. Storms communicated inventions of the '433 patent to Mr. McNamara are based on the e-mail and his attachments that he sent to Mr. McNamara, right?

A. Largely, yes.

Q. You're not basing your opinions that Mr. Storms is the inventor of the '433 on any information allegedly conveyed at the dinner, right?

A. I was not at the dinner. I don't know what happened at the dinner. I just know that the dinner occurred.

Q. And you agree the text messages Mr. Storms sent to Mr. McNamara do not communicate any aspects of the inventions of the '433 patent, right?

A. I believe that's right. The text messages that I'm recalling right now were just surface perfunctory kinds of things and requests for information.

MR. KAUFMANN: Can we pull up Exhibit 157.

BY MR. KAUFMANN:

Q. Dr. McClellan, you testified about this document earlier, right? This is the e-mail that Mr. Storms send to Mr. McNamara?

A. Correct.

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Q. Right. And this e-mail was sent at 11:32 in the morning on May 9, 2019.

Do you see that?

A. That's what it says.

MR. KAUFMANN: And can we pull up Exhibit 770.

BY MR. KAUFMANN:

Q. And this is the e-mail where Mr. McNamara forwarded Mr. Storms' e-mail, right?

A. That's what it appears to be, yes.

Q. And this e-mail was sent at 11:35 in the morning on May 9, 2019, right?

A. That's what it says.

Q. So Mr. McNamara forwarded Mr. Storms' e-mail three minutes after he received it, right?

A. According to the timestamps and the e-mails and assuming they were on the same time zone and that their e-mail clients recorded the time zone correctly, yes.

Q. And you see, actually, on the bottom e-mail that says May 9, 2019, 11:35, after that it says 0500.

Do you see that?

A. Yeah, it looks like they are in the same time zone.

Q. So Mr. McNamara sent his e-mail three minutes after he received Mr. Storms' his e-mail, right?

A. Agreed.

MR. KAUFMANN: And can we show the text of

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Mr. McNamara's e-mail. Or I'm sorry -- yeah, the text of Mr. McNamara's e-mail.

BY MR. KAUFMANN:

Q. The only think Mr. McNamara's e-mail says about any of the information that Mr. Storms sent is that his box seems very extensive, right?

A. That's what the e-mail says.

Q. Mr. McNamara's e-mail doesn't say anything about the spreadsheet that was attached, right?

A. The e-mail doesn't talk about the spreadsheet, but it includes the spreadsheet as an attachment because it was forwarded.

Q. But Mr. McNamara didn't say anything about the spreadsheet, right?

A. His e-mail doesn't say anything about the spreadsheet.

Q. And he didn't say anything about the drawing that was attached, right?

A. The e-mail doesn't say anything about the drawing.

Q. And there's not a single document or e-mail from anyone at Lancium after May 9, 2019, that ever refers to Mr. Storms or BearBox again, right?

A. I'm not aware of any document.

MR. KAUFMANN: Can we go to page 8 of Exhibit 157.

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And could we blow up the top two rows there.

BY MR. KAUFMANN:

Q. You talked about this spreadsheet a lot, right?

A. Yes.

Q. So you talked about the mining revenue column, right?

Do you see that column in the middle there, towards the middle?

A. Yes.

Q. And that's the mining revenue that you can earn from mining Bitcoin, right?

A. Right, that's the mining revenue associated with mining Bitcoin at that time under those Bitcoin network conditions and under that power price.

Q. Right. So that's the revenue that you could earn mining Bitcoin for a 5-minute period, right?

A. Right.

Q. You didn't consider the boot time that would be for the miners that would be used in Mr. Storms' system, right?

A. Yeah, as I mentioned in the deposition, there's a lot of variables in the real-world commercialization of the system that would change a lot of things. This seems to be a simulation that's trying to find the maximum and the minimum.

Q. So the only way to earn the estimated revenue there were actually if the miners were on and fully running for

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five minutes, right?

A. Which would be a function of their time, which would be a function of their stabilization, yeah. It would be a function of a lot of different things, right.

Q. And --

A. This is the maximum.

Q. And different miners have different boot times, right?

A. Presumably, all computers of different models and different characteristics have different boot times, yes.

Q. And Mr. Storms' calculations don't take into account the boot times at all, right?

A. No, I would refer to it as a best-case simulation.

Q. You agree that to determine the calculation of the breakeven mining cost, you'd have to look specifically at the software code that actually shows the calculation, right?

A. Determination of the breakeven cost?

Q. That to determine the -- what the calculation is of the breakeven mining cost, you'd have to look at the software code, right?

A. I believe it can be backed in through the data that's shown here, given the number of miners and the power of the miners and the cost of the data, the equation is pretty straightforward.

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MR. KAUFMANN: Can we pull up Dr. McClellan's deposition at Page 220, lines 8 through 11.

BY MR. KAUFMANN:

Q. At your deposition you were asked:

"QUESTION: And how -- what is the calculation -- that threshold, what is the calculation that you're using to calculate the breakeven mining cost?"

And you said:

"ANSWER: We'd have to look specifically at the code."

Right, that's was your testimony?

A. At that time we weren't looking specifically at the spreadsheet or the code, we were talking about what a particular variable was in the code. I think you'd have to look at the deposition further around that specific spot to find that context.

Q. So it's your testimony today that you could back out the calculation?

A. I believe that's true because it's -- you know the number of -- you know the -- the power consumption of the miners, you know the cost of the purchase of the power --

Q. Would that be difficult --

A. -- to back that out.

Q. Would that be difficult to do?

A. No.

MR. KAUFMANN: Can we pull up Dr. McClellan's deposition at Page 220, lines 12 to 18.
BY MR. KAUFMANN:
Q. You said --
"QUESTION: So to figure that out, you have to look at source code?
"ANSWER: Yeah, I mean, we can try to back it out from this, but that would be fraught with trial and error."
Right?
A. Yeah, that's true, it would be fraught with trial and error. You can look at it, you can calculate it, and you would assume that it would be right. And if all the numbers matched up, then you would be pretty assured that you were right. But to get it exactly right, you would need to look at the code that actually made the calculations.
Q. Okay.
MR. KAUFMANN: Can we go back to the spreadsheet on Page 8 of Exhibit 157.
BY MR. KAUFMANN:
Q. And there's a column, Day-Ahead LMP revenue, do you see that?
A. Right.
Q. You would agree that that column doesn't make sense, right?

A. Well, that's the column that's the revenue associated with the Day-Ahead LMP price.
Q. And you would agree that that column doesn't make sense, right?
A. Well, it's the revenue associated with the Day-Ahead LMP price.
Q. Dr. McClellan, you would agree that the Day-Ahead LMP revenue column doesn't make sense, right?
A. What do you mean it doesn't make sense? You're referring back to a specific point in the deposition where I said I couldn't figure out what the column meant with a little -- without a little more thought.
MR. KAUFMANN: Can we pull up Dr. McClellan's deposition at Page 213, line 12, through 214, line 14.
BY MR. KAUFMANN:
Q. Dr. McClellan, you were asked:
"QUESTION: What is the Day-Ahead LMP revenue?"
You said:
"ANSWER: Well, that's the revenue you make, that's the -- the Day-Ahead LMP is the day-ahead price, the Day-Ahead LMP revenue is the revenue you would make. And then that's the day-ahead, from consuming that power without mining."
That doesn't make sense, right?
A. Well, what doesn't make sense is why would you

consume the power without mining. The phrase "that doesn't make sense" is meaning that what I was saying doesn't make sense.
The Day-Ahead LMP price is the price that you would pay for the amount of power that you would sell back or purchase at that price point for that many units of power.
Q. So you think Mr. Storms' spreadsheet and what the day-ahead revenue is clear?
A. I believe it's the Day-Ahead LMP price multiplied by the number of power units that would be necessary to run the miners at that price.
MR. KAUFMANN: And can we pull up Dr. McClellan's testimony at Page 214, lines 15 to 20.
BY MR. KAUFMANN:
Q. And, Dr. McClellan, you were asked:
"QUESTION: "So the simulation that this spreadsheet represents, the Day-Ahead LMP revenue, is that the money that would be generated by the Bitcoin miner if it wasn't mining but is selling power, or is it something else?"
And you said:
"ANSWER: That one is confusing to me. I don't -- I'm struggling -- struggling with what that one means. The one on the right-hand side, the real-time LMP

revenue, is what you would make if you sold back at the real-time price."
Right, that was your testimony?
A. Yeah, when you sell back at the real-time price, it's pretty obvious that you want to make a profit. The day-ahead price doesn't help you make a profit, right, so that's why the day-ahead -- the day-ahead revenue is always beneath the mining cost.
MR. KAUFMANN: Can we go to PDX 3.34.
BY MR. KAUFMANN:
Q. This is one of the slides you prepared today, right?
A. Yes.
Q. And towards the bottom there, you said that the amount of power used in an interval, (MPT), is your opinion the amount of power used in an interval is the minimum power threshold?
A. The amount of power used in that interval is the amount of power that would be required to run the Bitcoin miners during that minimum.
Q. So that's not the minimum power threshold?
A. Well, the amount of power that's used by the Bitcoin miners in this simulation coincides with the minimum power threshold.
Q. At your deposition you said it was the breakeven value that gives you the minimum power threshold, right?

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A. Right, they are the same thing. The breakeven value is the amount of power that you wold -- the breakeven value is the amount of money that you would have to make by mining Bitcoin using that amount of power for that amount of time, and that's how much money would be associated with the use of that much power, so that's the breakeven.
Q. So in Mr. Storms' simulation, the breakeven is a minimum power threshold, right?
A. The breakeven value is the minimum dollar threshold. I believe the breakeven value is a dollar amount. But I don't recall, I'd have to look at the spreadsheet to remember exactly -- I'd have to look at the code to figure exactly what the breakeven value represents.
MR. KAUFMANN: Could we pull up Dr. McClellan's testimony at Page 158, lines 11 through 17.
BY MR. KAUFMANN:
Q. At your deposition you said: "I believe the breakeven power price includes the minimum power threshold," right?
A. That's right. The amount -- that's the amount of power that would be required to run those miners for that duration.
Q. Okay.
MR. KAUFMANN: And could we go to TX24.
BY MR. KAUFMANN:

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Q. This is one of the source code files that you talked about today, right, the R main AEC?
MR. KAUFMANN: Could we go to the top there.
BY MR. KAUFMANN:
Q. All right. This is one of the files you talked about today?
A. Yes.
MR. KAUFMANN: And could we go down to lines 63 to 66.
BY MR. KAUFMANN:
Q. You talked about this earlier, right, at line 65 there's the formula for the breakeven value?
A. Right.
Q. Right. And that uses the KW_load value in that calculation, right?
A. Right, it's passed into that function as an argument.
Q. And so is it your opinion that the KW_load or kilowatt load for a 5-minute period is the minimum power threshold in Mr. Storms' system?
A. KW_load is the amount of power that would be required to run all the miners without turning any of them off for a period of time. So KW_load is a target -- a target that the -- that the system is trying to achieve in terms of power expenditure versus Bitcoin mining revenue.
Q. And that's used to calculate the breakeven value,

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right?
A. That's clearly used in that equation to calculate the breakeven value.
Q. And the breakeven value reflects the minimum power threshold in Mr. Storms' system, right?
A. The breakeven value reflects the amount of power that's required to run the miners. And it's scaled by the effectiveness of the mining operation, the amount of Bitcoin that would be produced and so on.
Q. And in Mr. Storms' simulation, the breakeven mining cost is used to term whether it makes sense to mine or not, right?
A. That's right.
Q. And that's the minimum power threshold, right?
A. The breakeven value is the amount of power that would be consumed by the miners as compared to the amount of money that would be made by the Bitcoin mining operation.
MR. KAUFMANN: Can we go to Dr. McClellan's deposition at Page 236, lines 5 through 9.
BY MR. KAUFMANN:
Q. Dr. McClellan, at your deposition you were asked:
"QUESTION: That's the breakeven mining cost, it's telling you whether it makes sense to mine or not?"
And you answered:
"ANSWER: That's where the power threshold comes

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from, right, that's the minimum power threshold."
Right? So it's the minimum power threshold that tells you whether it make sense to mine or not, right?
A. That's -- we're all saying the same thing, right. The -- the kilowatt load is the amount of power that would be consumed by that group of Bitcoin miners, and that's used in determining the breakeven point based on the amount of money that would be made by using that power to use -- to mine with those miners for that period of time.
Q. And so Mr. Storms' simulation is focusing on ways to make positive dollars, to make money, right?
A. Yes.
Q. It's trying to maximize profitability, right?
A. That's right.
Q. And, in your opinion, it doesn't make sense for Mr. Storms' system to use a certain amount of power if the system is losing money using that power, right?
A. Well, Storms' simulation is trying to show the best case of converting contracted power into dollars either via sell-back or via Bitcoin mining. So you're taking in a certain amount of power, you're using that power to run your miners, or you're estimating how much money you would make if you used that power to run your miners.
And you're estimating how much money you would make if you used that -- if instead of using that power, you

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sold that power back into the market. And you're using the best course of option -- course of action, based on that optimization process.

Q. So in the system or the idea that Mr. Storms' documents or spreadsheet conveys, does it convey a requirement that regardless of what the breakeven mining cost is, that if the system is -- or if the system is losing money mining Bitcoin, that it would still mine Bitcoin anyway?

A. The simulation is -- the purpose of the simulation is to optimize the amount -- is to show the optimum amount of money that could be obtained through that decision-making process.

Q. Mr. Storms' simulation doesn't teach that you -- a situation where you would mine Bitcoin if you were losing money doing that, right?

A. The simulation could be mining that load, but the purpose of the simulation is to show that you can make money doing certain -- things as certain way. You can certainly assume that the price of power is higher, and you can assume that Bitcoin miners run regardless.

But the simulation -- the purpose of the simulation is to contrast the amount of money you make doing things one way versus doing things another way.

MR. KAUFMANN: Can we go to Dr. McClellan's deposition at Page 236, lines 10 to 18.

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BY MR. KAUFMANN:

Q. Dr. McClellan, at your deposition, you were asked:

"QUESTION: Is there a requirement that regardless of what that breakeven mining cost is, it could be negative, that the system still must use X amount of power, even if they are losing money mining Bitcoin doing it?"

And you said:

"ANSWER: Why would you mine Bitcoin to lose money? That doesn't make any sense. This doesn't teach that."

That was your testimony, right?

Exactly what I've repeated here. The purpose of the simulation was to show how much money you could make by effectively mining Bitcoin. The simulation could be adapted to show how much money you could lose mining Bitcoin count. It doesn't matter. But the simulation was to show a maximization of revenue.

And your testimony today is that the interpretation you have always had of the '433 patent is consistent with the Court's construction of the terms Power Option Agreement and minimum power threshold, right?

A. There are multiple types of Power Option Agreements. At the time of deposition and at the time of the report, the

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Court had not made a construction, and I think that was brought out in the deposition. I was a little bit surprised that that hadn't happened at this point because my familiarity with intellectual property cases is that that happens pretty early on.

So I was surprised about that and I asked it. The issue is there are multiple types of Power Option Agreements as we heard from Mr. McCamant yesterday. I am loosely familiar with some types of Power Option Agreements, but in every option agreement, whether it's a Power Option Agreement or an equity option agreement, there's a buyer and seller. And there are different styles of options --

Q. Dr. McClellan, I asked you if your opinions are consistent with the Court's claim construction. That's a yes or no question.

MR. RICORDATI: Objection. Opened the door. Witness should be allowed to answer.

THE COURT: I think he finished his answer, so you can go ahead.

THE WITNESS: I have a little bit more.

THE COURT: Well, counsel for plaintiffs will have an opportunity to cross-examine you.

THE WITNESS: Okay.

THE COURT: To redirect you, rather.

BY MR. KAUFMANN:

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Q. Dr. McClellan, your opinion that Mr. Storms invented the '433 patent is based on what the claims of the '433 patent mean and require, right?

A. Yes.

MR. KAUFMANN: And can we go to PDX 3.29.

BY MR. KAUFMANN:

Q. This is one of the slides you prepared today, right?

A. Yes.

Q. This is the Court's constructions, right?

A. That's the Court's claim construction on those terms.

Q. Right. And so the Court construed Power Option Agreement to mean an agreement between a power entity associated with the delivery of power to a load and the load, wherein the load provides the power entity with the option to reduce the amount of power delivered to the load up to an agreed amount of power, during an agreed upon time interval such that the load must use at least the amount of power subject to the option during the time intervals unless the power entity exercises the option.

Right, that's the Court's construction --

A. Yes, I agree with that construction.

Q. And the Court construed minimum power threshold to mean a minimum amount of power a load must use during an associated time interval, right?

A. Yes.

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anything to do with -- particularly to do with fine-grained load management, other than the fact the cgminer watchdog makes sure that the Bitcoin miners are available.
Q. Right. And so you would agree that cgminer watchdog doesn't have anything to do with fine-grained remote control?
A. Well, in as much as it needs to be running to make sure that the Bitcoin miners are functional when they're called upon to do something.
MR. KAUFMANN: Can we call up Dr. McClellan's testimony at Page 205, lines 23, to 206, lines 9.
BY MR. KAUFMANN:
Q. In your deposition you were asked:
"QUESTION: Watchdog doesn't have anything to do with fine-grained load control does it?
And you said: "ANSWER: No, that's a system health issue."
Right; you're not changing your testimony, right?
A. I'm not changing my testimony. I'm explaining that if the cgminer watchdog detects that some of the systems are unavailable, that has to do not with fine-grained load control but with the system health where the availability of those miners is reported back to the control system.
So it doesn't have to do with the control of

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those items, it has to do with constraints on the control of those items.
Q. The only instructions that the BearBox simulation code sends to miners or to the PDUs that the miners would be connected to is to turn them all on or all off, right?
A. Yes, that's what the simulation does. It's trying to establish a maximum.
Q. And you've talked a lot about the BearBox source code during your direct examination, but none of the BearBox source code files were ever sent to anyone at Lancium, right?
A. I'm not aware who received what source code, I thought that Lancium had an expert who reviewed source code.
Q. Is it your opinion that Mr. -- Dr. Storm -- strike that.
Is it your opinion that Mr. Storms communicated the inventions of the '433 patent to Lancium based on him communicating the source code?
A. I think I must have misunderstand the question that you asked. Can you ask it again.
Q. Mr. Storms did not send any source code files to Mr. McNamara or anyone at Lancium?
A. Yeah, I misunderstood the question. That's correct, he did not send any source code.
Q. No one at Lancium ever had access to any of the

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BearBox source code files, right?
A. As far as I'm aware, until the trial, when it was provided to Lancium's expert.
Q. You testified that Mr. Storms' source code --
MR. KAUFMANN: Actually, can we pull up PDX3.5.
BY MR. KAUFMANN:
Q. So you've said that Mr. Storms' source code makes decisions based on current and expected energy usage, right?
A. Right.
Q. And you highlighted two values as current and expected energy usage, right?
A. One of those values is not an energy usage, it's an outcome associated with the energy usage. The second value is unexpected energy usage associated with the use of the Bitcoin miners.
Q. Right. The KW_load or kilowatt load is an expected energy usage, right?
A. Right.
Q. And Mr. Storms' system assumes that the value of kilowatt load is the current energy usage, right?
A. Mr. Storms' simulation is set up to use all of the miners when -- when -- when the time has come to mine, it's -- it uses all of the miners simultaneously. So it uses this global variable to represent the entire energy usage of all the miners operating simultaneously.

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Q. It uses this values to represent the current energy usage, right?
A. It uses this values to represent the target energy usage based on the current conditions that are retrieved.
Q. What is the current energy usage in Mr. Storms' system?
A. What do you mean by "current energy usage?" Are you asking if there's telemetry that retrieves energy usage from the miners? I think we covered this in the deposition. His system is not set up to retrieve telemetry associated with the instantaneous energy usage of the miners.
Q. Right. Mr. Storms' system assumes that the kilowatt load is the current energy usage, right?
A. It uses the kilowatt load as an estimate, as an overbounding estimate for the amount of power that would be used by all the miners in operation simultaneously. It's an overbound, that's why it's multiplied by 1.05 to account for any differential.
Q. And the current power usage is not a threshold, right?
A. The -- I'm not sure what you're saying. The current power usage is a telemetry value that you would retrieve from a system. The instantaneous power is a telemetry value that you would retrieve from a system to show what kind of energy it was using at that particular time.

Q. Dr. McClellan, is the current power usage a threshold?
A. Depends on how it's used.
MR. KAUFMANN: Can we pull up Dr. McClellan's deposition at Page 149, lines 10 to 13.
BY MR. KAUFMANN:
Q. You were asked:
"QUESTION: Is the current power usage, is that a threshold?"
And you answered:
"ANSWER: No."
That was your testimony, right?
A. The current power usage -- what I just said, the current power usage, if you were telemetry -- if you had telemetry for a system, the current power usage would be the instantaneous value of power that's being used at that time. That would be my interpretation of the term "current power usage."
Q. Dr. McClellan, you were asked: "Is the current power usage, is that a threshold?"
And you answered: "No."
That was your testimony, right?
A. Correct. The current power usage is not a threshold, it's a telemetry value that you retrieve from a system.
MR. KAUFMANN: And could we go back to PDX 3.5.

And can we blow up the red circle part.
BY MR. KAUFMANN:
Q. Right. Okay. So during your direct, you said that the kilowatt load value overestimates the amount of power being used by using that 1.05 number. I think you called that a fudge factor, something like that?
A. It looks -- it appears to me to be a 5 percent overshoot.
Q. Right. So it's -- the system is overestimating how much power the system would use?
A. Right. It's overestimating the amount of power that would be used by all the miners simultaneously in operation.
Q. If you were trying to make sure that you were using at least a certain amount of power, you wouldn't want to overestimate how much power you were using, right?
A. I'm not -- if you are trying to make sure you were using at least amount of power, you would definitely want to overestimate. You would want to make sure that you were constructing your system where it would use at least that much power.
Q. Right. And if you were overestimating how much power you were using, you wouldn't know if you were actually hitting the threshold, right?
A. Well, the idea behind this is a target power.
Q. Right. And so if you were trying to make sure that

you are using at least a certain amount of power, you wouldn't want to overestimate how much power you are using; right?
A. If you were building a system that needed to use at least a certain amount of power, you would want to make sure that you corrected the values in the system that would estimate -- that were estimating the amount of power to be used, would force the system to use the power that you were trying to achieve.
Q. Well, if you were trying to use a certain amount of power and you were overestimating how much your system -- your system was using, how would you know if you were using the target?
A. Well, you don't know if you're -- you don't know what you're using because there's not telemetry in his -- in his simulated system there's not telemetry, so you don't know how much power you're being used. You're simulating how much power you're expected to use with all the miners, given their specifications.
Q. And I believe you said this, but kilowatt load is not a value that the code is measuring, right?
A. It's a global variable that's set in initialization that's used by subsequent modules.
Q. Even if you ran a BearBox at maximum capacity, it might not use its maximum load, right?

A. Well, the BearBox has more load to it than just the Bitcoin miners, so there's additional items that are consuming power that give you a little bit of a -- a little bit of a cushion there.
Q. Right. And if you're trying to run a computer at it's max capacity, you testified about this earlier, right, computers can overheat and their efficiency goes down. So just because you want a computer to run at its max capacity, doesn't always mean it always does, right?
A. Well, yeah, it's -- computers have variable performance characteristics.
Q. You talked about the hashrate that Mr. Storms' container could perform, right, in the product spec sheet?
A. Yes.
Q. You didn't compare that hashrate to any other Bitcoin mining containers, right?
A. I was -- no, I was not comparing Mr. Storms' implementation to any other implementation.
Q. So when you said that Mr. Storms' containers hashes very well, you weren't talking about that in relation to any other containers, right?
A. I was not comparing it to any other containers. I was saying that it produces a large number of hashes. I mean, Mr. Storms' simulation data has a description of several other types of miners that produces hashes at a

A. Yes. I was initially part of the scientific computing organization at Sandia National Lab developing codes and assisting other people in developing codes for high-performing computing simulation.
Q. And did you write code at that job?
A. Yes.
Q. What languages did you write it at that time?
A. A number of different languages, including Fortran, and C, C++. And then some specialized languages for high-performance computers.
Q. Can you summarize your Science Applications International Corporation.
A. At Science Applications International Corporation, also known as SAIC, I was a director of distributed computing and ran a group that did consulting for both government and commercial clients.
Q. And you also were at University of Houston for some time. Can you briefly describe your experience at the University of Houston.
A. I had a number of positions at the University of Houston, including a faculty position in the college of technology where I did research in smart grid technology.
Q. What kind of research in smart grid technology did you do?
A. I was involved in several programs on cyber security

and smart grid. I also had a grant from the Department of Energy for workforce training in the electric power sector.
Q. So it's my understanding you also have personal experience in Bitcoin mining?
A. Yes, that's correct.
Q. Can you describe that experience.
A. I started out my Bitcoin mining by purchasing a hashrate contract from a company called Genesis Mining. And that was a given amount of hashrate that they ran on their machines.
I did that to get familiarity with the Bitcoin network, the Bitcoin mining function. And after that, I purchased a number of Bitcoin miners, both myself and with a business partner, and we had those running in a couple of different hosted facilities.
Q. And in the course of that personal experience, did you become familiar with the terms and the meaning of miner hashrate?
A. Yes, that's a measure of the power of a miner in terms of the number of hashes it can accomplish per second.
Q. What about the meanings of global hashrate or network hashrate?
A. That's the estimate of power of the total Bitcoin mining network globally.
Q. What about the terminology network difficulty?

A. Network difficulty is a -- is a factor used to assure that the -- it's called the block solved time in solving a block of Bitcoin transactions. It stays right around 10 minutes and it's adjusted as necessary over a period of time.
Q. And what about the terms "block height"?
A. Block height is the number of the block -- the last block solved in the Bitcoin mining network sequentially from the beginning of the block chain.
Q. And I'm -- at that time you're also familiar with the Bitcoin price, correct?
A. Yes, that's the price on a number of different exchanges for what the -- what a Bitcoin is valued in different currencies.
Q. And what -- during what time frame were you doing this personal mining and did you come to the understanding of the terms that you just -- that I just asked you about?
A. Starting in 2015, 2016. And then in the 2016/2017 time period was when I owned ASIC miners, the physical mining machines.
Q. And this is before coming to Lancium?
A. Yes.
Q. All right. Let's -- let's turn to Lancium. Are you one of the cofounders of Lancium?
A. Yes, I am.

Q. Can you just real briefly describe sort of what the vision of Lancium was when you helped to cofound it?
A. So the vision of Lancium was that at that time we were seeing an increase in the amount of renewable energy that was being produced in the United States, and that that increase in the amount of renewable energy caused periods of low price, power, and periods of high price power, and a lot of volatility in the price of power.
So the initial vision was determining how we could take advantage of the -- that variability in power price.
Q. And how did you -- what -- what -- when was Lancium -- when did you cofound Lancium?
A. Initially Lancium was formed in November of 2017.
Q. So at the -- at the time of the cofounding, what did you do -- what was your next step to try to take advantage of the -- the price differences that you were noticing?
A. The main thing that we were looking at is what types of loads could be useful in adjusting to take advantage of that renewable power generation that we could turn up and turn down as the price varied.
Q. And what -- when you say "renewable power generation," what kind of power were you thinking of at that time?
A. Wind and solar, in particular, but mostly we were

looking at wind.

Q. And when you were turning -- thinking about loads and flexible loads, did you come to a conclusion as to a particular type of load that might be -- sort of fit the -- fit the description of what you were looking for?

A. At that point in time, most demand from commercial loads had been decreasing. The one area where demand for load had been increasing was in the datacenter space. And so we were looking at both Bitcoin mining datacenters and traditional datacenters.

MR. NELSON: Could I get TX373 and 374, please.

BY MR. NELSON:

Q. Are you familiar with this document? You can just look on the screen, Dr. Cline, it should be right up in front of you.

A. Oh, yes. Yes, I'm familiar with this. It's an e-mail of -- 27th of December 2017.

Q. And what about 374, the presentation on the right?

A. Yes, that's a presentation that I reviewed and had input into.

MR. NELSON: Can you turn to page -- can I get Page 25182 pulled up.

BY MR. NELSON:

Q. So can you look at, at the figure on the right and explain what is being depicted there?

A. This is depicting what we refer to as a flexible datacenter. And it shows a number of computing devices, which could be Bitcoin miners or traditional compute devices, arraigned in racks within a container that could be deployed at a wind farm.

You have two different views here, a side view and a top view. And it also indicates where space could be taken up by other functions of the box, such as cooling systems, power distribution systems, communication systems.

Q. And why where you looking at putting this next to a wind farm?

A. We were looking to place these on wind farms because the power output of the wind farm was highly variable, but yet there was usually some amount of power that was always being produced, so that we could absorb the power of the wind farm when prices were low.

And then when prices were high, depending on the contract we would have with the wind farm, we could -- we could ramp down the datacenters to allow the wind farm to sell that power to the grid, in which case they would have a higher margin.

Q. And if you look at the bullet point, the first bullet point where it says: "Small footprint units that can absorb or drop load nearly instantly," what did you intend to mean at this time? This is December 27, 2017.

A. So we were looking at a way to adjust power consumption in the order of about five minutes down and about five minutes up.

Q. And if you look at the portion that says "the opportunity," what opportunity are you talking about?

A. So there are opportunities, both for Lancium and for the wind farm. By agreeing to not use power during high-priced periods, that could improve the -- the profitability of the wind farm. By choosing -- by purchasing power at an agreed-upon price, we would basically put a floor on the -- on the power that we were using and, therefore, the wind farm would not encounter any negative pricing on that.

For ourselves, the opportunity was that by such an agreement, we could get a lower overall affected power price, which would increase our margins.

Q. And are you familiar with the term "behind the meter"?

A. Yes.

Q. And were you looking at this solution at this point to be behind the meter?

A. Yes.

Q. What does behind the meter mean?

A. Behind the meter means that it is connected directly to the wind farm before the wind farm passes power to the -- to the grid.

Q. And I think earlier you said -- you talked about ramping up and ramping down individual miners. What is -- what do you mean when you say ramp up or ramp down?

A. To basically -- at this point in time we were looking at power system elements that could turn the miners off and turn them on in terms of their operation and hashing functions for Bitcoin miners. And that could be accomplished in a number of different ways, through the use of breakers or switching power distribution units, or switching elements on power outlets in a smart power distribution unit.

We were also looking at possibilities of using software to do the same -- accomplish the same result.

Q. And if you look at if bullet .2 on Page 25182, it says: "Internal designed with multiple pending -- multiple patent-pending elements."

Do you see that?

A. Yes.

Q. What do you mean by that?

A. As we went through our designs, we had several innovations that we wanted to protect and we sought patent coverage on those innovations.

MR. NELSON: Can I get TX163.

BY MR. NELSON:

Q. And if you look at the cover page of this, can you just tell me what this -- what this document is?
A. Yes, this is a -- one of the patents that we received.
Q. And you're the Raymond Cline listed here as an inventor?
A. Yes.
Q. And the priority date is January 11, 2018?
A. That's correct.
Q. And the title, what's the title?
A. "Method and System For Dynamic Power Delivery to a Flexible Datacenter Using Unutilized Energy Sources."
MR. NELSON: Can I go to figure six at Page 88.
BY MR. NELSON:
Q. So can you just high level explain what's going on in figure six?
A. The turbines in this figure are meant to represent a wind farm. You can see the flexible datacenter element 200 there connected to the power distribution system of the wind farm. There are also -- the local power substation of the wind farm represented here, and also connection to the power grid.
Q. And let me -- so what is flex -- what is the block 200 flexible datacenter?
A. That is the concept that we showed in the -- in the

previous presentation. The flexible datacenter that includes a number of computing devices that can be ramped up and ramped down to meet the requirements associated with the power derived from the wind farm.
Q. Bitcoin miners would be one of those type of -- one of those types of computer systems?
A. Yes. And also traditional computing devices.
MR. NELSON: Can I get Page 84, please.
BY MR. NELSON:
Q. And so is this -- this is also labeled 200, so is this an example of the flexible datacenter that we just referred to in figure six?
A. Yes, it is. It includes the individual computing devices labeled 100. And those devices are organized into racks. And, also, those racks are organized into subsets of collections of computers.
The system 220 represents a flexible datacenter control system, and there are a number of other elements in there representing power distribution, communication, air flow for cooling through the container.
Q. Let me go to Page 59. This is paragraph 30. And I'll just read it -- read portions of it and then ask you a quick question.
So "datacenter control system 220 may be a computing system configured to dynamically modulate power

delivery to one or more computing systems 100."
What do you mean by "dynamically modulate power delivery"?
A. By dynamically modulate power delivery, at this point we were looking at having power on or off to individual devices or groups of devices, computing devices, through electrical switching-type approaches. And we were also looking at software systems to accomplish the same.
Q. So the electrical switching device type systems, were you contemplating -- did you know what smart PDUs were at this time?
A. Yes, a smart PDU is a Power Distribution Unit that has individual sockets, if you will, connections that can be turned on and off individually to provide power to a device connected to that socket.
Q. And you also said you were contemplating software solutions, can you explain that?
A. Yes, we were looking at ways that we could issue commands to the computing devices themselves to adjust the power utilization.
Q. Sort of bypassing the PDU, if you will?
A. Yes.
Q. So just make sure I understand. So from a PDU perspective, is that -- that's withdrawing all of the power from a miner?

A. Yes.
Q. And the software solution you were thinking of, was that withdrawing all of the power or part of the power?
A. Part of the power. When you withdraw all of the power from the miner or computing device and then you power it back on, that has a tendency to put stress on the power supply, which could cause problems if you did that on a reoccurring basis.
So we were looking, from a software standpoint, to reduce that stress on the systems. And, also, when you remove power and turn it back on, you have to reboot the system, so we were looking to be able to have a quick response, and we were investigating software to see if that was a route to have less stress on the power supply units and a faster response.
Q. So let's go to paragraph 33 at Page 60. So I'll read a portion of it again and ask you a question.
"In this way, datacenter control system 220 may modulate power delivery by either ramping up the flexibility to -- flexible datacenter to fully operational status, ramping down flexible datacenter 200 to offline status, reducing power consumption by withdrawing power delivery from or reducing power to one or more computing systems 100 or groups of computer systems 100."
Can you explain what's going on there?

A. Basically this is saying that we can turn on and off the entire flexible datacenter, we can turn on and off the individual computing systems within that datacenter, and we can turn on and off collections of computer systems within that datacenter.
Q. Under what circumstances would you want to or did you conceive of turning them on or off on an individual or a group basis?
A. At the wind farm, the wind farm produces a certain amount of power, and we would have an agreement with the wind farm on how much power we could utilize. If the generation of the wind farm went below that amount of power, we needed to make sure that our systems consumed less than the power that the wind farm was -- was generating.
So we would have to turn down the number of the -- the amount of load that we had. And by having granularity on an individual computing system basis or group or an entire flexible datacenter, it gave us more control over what we could target.
Q. Let's go to 74. This is paragraph 68.
In certain embodiments, monitoring may include receiving information or an operational directive from the local control station of the grid operator corresponding to unutilized behind-the-meter power availability.
What were you monitoring here?

A. We're monitoring directives from the wind farm and potentially the grid operator, but we're also monitoring supplemental information that could lead to other determinations in terms of the amount of power that we would consume.
The most important thing being how much power was available to us to consume. But then there were other directives -- I mean, other information that we would gather that would tell us more about what the profitability of actually consuming that power would be.
Q. It says, "Monitor may include receiving information."
So what information you were monitoring that you might receive?
A. We're looking at what the real-time price of power would be, what the price of Bitcoin was so that we could determine whether it was profitable for us to mine Bitcoin or not.
Forecasts from the grid or the wind farm operator as to what the power generation of the wind farm would be in the near future, what the consumption of power and of the grid was relative to the capacity, which would have a potential impact on price going forward. There were a number of things that we were monitoring.
Q. It also says you're monitoring operational directives. So let's go to paragraph 64 -- I'm sorry, page

64, paragraph 44.
It says: "An operational directive may be based on current dispatchability, forward-looking forecast for when unutilized behind-the-meter power is or is expected to be available, economic considerations, reliability considerations, operational considerations." And then it continues.
What economic considerations were being considered at this time?
A. The economic considerations would be what the economics were relative to the power generation of the wind farm and what our agreement with them was in terms of whether we needed to turn down our usage at high price periods so that they could sell power back into the grid.
Economic considerations also included on our part whether it was profitable or not to mine Bitcoin.
So those are examples of the economic considerations.
Q. So these things that were being monitored, what did the -- what did you conceive the system described here in this patent application would do with those things?
A. So the system would take in the information, determine -- first of all, make sure that we were -- there was a maximum amount of power that we could use from the wind farm. So that was a threshold that we needed to make

sure that we consumed that amount of power or less that we could not exceed.
And then beyond that, understanding what our agreement was with the wind farm and consuming power based on economics and also what the economics were of mining Bitcoin relative to the price of power.
Q. Okay. So let me go to page 90, figure 9.
MR. NELSON: Can I get Figure 9 blown up.
BY MR. NELSON:
Q. Can you just briefly take me through the steps here of the decision-making process of the system described in the '632 application.
A. So the first box is a message that we would receive from the wind farm in terms of the amount of power that was available to us. Again, that's a threshold that we needed to make sure that we never exceeded. But we could consume less power than that threshold. And that was dependant on economic considerations, reliability considerations and operational considerations.
And once we determined what power we were targeting to consume, we would set a strategy on how to achieve that target and then send directives to the computing systems to meet that strategy.
MR. NELSON: Let's go to TX462 and 463.
BY MR. NELSON:

Q. So now let's advance. We're January 2018 in the '632 application. Now, we're near -- we're March 29, 2018, so a couple of months later.

MR. NELSON: Could I get the deck up as well.

BY MR. NELSON:

Q. So what is the Lancium PowerPoint here that's being described -- what is this document?

A. This is a PowerPoint that was being developed for presentation at a Bank of America/Merrill Lynch investment conference to my understanding.

MR. NELSON: So let me get page 27993.

BY MR. NELSON:

Q. So you see where it says "ramping less than five-minutes"?

A. Yes.

Q. So what is -- what is meant by that?

A. That was our target for the product that we were designing to deliver. And the 5-minute time frame comes from two elements.

One is that ERCOT recalculates what the real-time price of power is every five minutes, so we would need to be able to adjust within that time frame based on economic considerations.

The other element is, in discussions with wind farms and looking at data from wind farms, that five minutes

or less was typically the time frame that you would see the variation in the output of a wind farm, so we needed to make sure that we could respond within that time frame.

Q. So the figure on the right, that's not Lancium data, correct?

A. No, that's just a -- a conceptual representation of data.

Q. So at this time, January -- or March 29, 2019, did Lancium actually have an up-and-running system?

A. We had -- we had a number of miners at our Thomas Road facility in Houston, Texas, that we were using to develop and test our solutions.

Q. Do you remember about how many miners you had?

A. It was about 120.

Q. So you talked about Thomas Road. Can you just describe briefly what Thomas Road is?

A. Yeah, Thomas Road is a warehouse facility that was used for our research and development. It was also the location of our network operating center referred to here as the NOC, where we would monitor and control multiple wind farm sites.

Q. So this is -- this is four months or so after Lancium was formed.

How many people were working about with Lancium at this time?

A. I don't know the number exactly, but it was definitely less than ten.

Q. You were a startup, basically?

A. Yes.

Q. Why did you -- why did you want to have miners at Thomas Road?

A. So we could develop and test our solutions and improve them over time.

Q. Was there commercial software for ramping miners up and ramping miners down available at this time?

A. No.

Q. At that time -- earlier on in your testimony and earlier on in the time line, you were talking about looking at hardware solutions or software solutions to control the miners.

Had you made a decision at this point in time which way to go?

A. We had begun working with a third-party piece of software and a commercial off-the-shelf software and did modifications to those to accomplish ramping up and ramping down. But we considered both hardware and software considerations at this point in time.

Q. But at that point, you were working toward the software considerations; is that right?

A. Yes.

Q. What's the name of the software you were looking at that time?

A. Third-party software is a Tier44 software. And then the commercial off-the-shelf piece of software was ServiceNow. We directed modifications to both software platforms, if you will, to accomplish what we needed.

Q. So you actually went forward with the ServiceNow, Tier44 software solution-based system?

A. At that time, yes.

MR. NELSON: Can I get TX199 and 200.

And if we go to page 16282.

BY MR. NELSON:

Q. And you see on this page it's talking about configurable algorithms.

Can you tell me what the configurable algorithms were that you're considering and talking about in this slide.

A. On the configurable algorithms, we are still looking at both Bitcoin mining as one option for the flexible datacenters. We're also looking at more traditional computing platforms. And the configurable algorithms here refer to the scheduling and prioritization of workloads on those platforms to achieve the highest margin.

Q. And what -- why were you -- why were you conceiving and considering of looking at different prioritizations of

jobs to achieve the highest margin?
A. So there are a number of reasons why on a traditional computing platform you might want to prioritize different jobs. One might be that you have a client who is willing to pay more for their applications to be done faster.
Another thing might be that if we had ramped down a datacenter and brought it back up, we might have a time frame in which we needed to deliver the total result of the calculations and, therefore, we would prioritize those workloads over other workloads.
The other thing is that we could shift, potentially shift applications from one location to another based on economics within the power system.
Q. So let's jump out of the timeline for a minute here.
The '632 application, that's not the only application that you're a named inventor on, is it?
A. No, I'm named inventor on a number of patent applications.
MR. NELSON: So let's pull up TX165.
BY MR. NELSON:
Q. Is this one of the applications?
MR. NELSON: Go to page 3317.
BY MR. NELSON:
Q. Is this one of the applications you're a named inventor on?

A. Yes.
Q. It's "Redundant Flexible Data Workload Scheduling."
Is that the title?
A. Yes.
MR. NELSON: Let's pull up -- actually, let's go to page 3151 first. And paragraph 53.
BY MR. NELSON:
Q. And look at -- on the underline it says: "In addition to the deadline for completing the computational operation may signal that the computational operation is high priority."
What's being meant there?
A. So as I described, this could be that a client had agreed to pay a higher fee to accomplish their workload in a shorter period of time, in which case it would be a high priority.
The other option is that if we had suspended workloads by turning down power, we might have to prioritize those workloads when we return power to the system.
MR. NELSON: Let's go to TX371 and TX979.
BY MR. NELSON:
Q. And can you look at these two documents and confirm that the 979 attachment is the actual attachment to the Exhibit 371. They got separated somehow.
A. Yes, that's correct.

Q. So look at the -- look at the e-mail first here, Exhibit 371. There's a company or an entity there named TAS.
Can you tell me what TAS is?
A. It's referred to as TAS. It is a manufacturer in the Houston area that specializes in mobile computing solutions and containers.
Q. And why were you talking to TAS?
A. We were talking to them about designing and manufacturing a container for us. In this case, particularly within the Bitcoin mining space.
Q. And what was the size of that container?
A. It was 1.6 megawatt 40-foot container.
Q. You're actually talking about four of them, aren't you, in the e-mail?
A. Yes, that was a discussion we had about an initial delivery of up to four containers.
Q. And look at the column on Exhibit 979 on the right. And building controls, fans, misting system, fire systems, provisions for security.
Do you see those?
A. Yes.
Q. Are those things important in a mining container?
A. The fact that we were going to be deploying these mining containers on a wind farm, the wind farm operator

would have certain requirements for safety and quality control on the elements that were used to build the container. So that led to things like the fire suppression system.
The mining -- the misting system was used to -- and the fans were used to control -- I mean to cool the miners, and there were also provisions for security entry, so that we could limit the -- the personnel who were inside the container at any point in time.
Q. And help me understand. I mean, these containers, these things -- I mean, they use quite a bit of power, don't they?
A. This was -- an individual container was going to consume 1.6 megawatts.
Q. And on -- on exhibit -- this was one contemplated at holding 980 miners; is that right?
A. That's correct.
Q. And so what happens if somebody goes in there and there's a short and the components aren't -- I mean, is this the type of thing that can kill somebody?
A. Yes. So that was part of the safety consideration in terms of the layout of the container and how the -- how the power was distributed within the box. And the quality of the components that were used in constructing the box.
Q. Did TAS, TAS ever build a box for you?

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A. No, they did not.
Q. Why not?
A. They wanted a commitment of between 60 to 70 containers. And at that time, we did not have a contractual commitment from a wind farm that would have enabled us to enter into that agreement.
Q. Were you looking at other container makers at this time?
A. We were looking at containers from sort of off-the-shelf manufacturers, but we were also discussing with a group out of Canada that had designed and deployed -- designed, developed, and deployed containers for a Bitcoin miner in Canada.
Q. What was the name of that group?
A. That group included Ready Engineering, which is an engineering -- a contract engineering firm, and JV Driver, which is a fabricator.
Q. Let's go to TX190. So this is an e-mail dated June 27, 2018. This is from you, correct?
A. Yes.
Q. So can you tell me what this e-mail is discussing?
A. This e-mail is discussing -- discussing that when we look to use software to suspend the hashing on the miner, which consumes the most amount of power in the mining device, there were a number of programs that were also

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running on the miner watchdogs and -- and various types of other jobs that were there to assure that the mining program stayed working.

So part of the problem was whenever we used software to suspend the hashing application on the miner, that the -- the rest of the applications on the miners would restart the hashing. And that meant that we could not have deterministic control over the hashing on -- on the miner.

What this e-mail points out is that I found a way, using operative system directives, to basically kill not only the hashing function but all of the watchdog timers and oversight applications simultaneously so we could drop down the power utilizations of the miner.

And through operating the system's directives, restart all of those applications simultaneously so that they could restart the hashing function and consume power up -- up to the maximum.
Q. So let me make sure I understand. So, basically, you could turn them off with software pretty easily, but they kept turning themselves back on because they had sort of safety mechanisms in them?
A. That's correct, until I found this mechanism to -- to ensure that when we turned off those functions, they stayed off.
Q. How much time did you spend solving this problem?

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A. This was several weeks of in-depth testing on -- on the miner operating system.
Q. And why was -- why was this a significant problem -- why was this -- why was it significant that you solve this problem?
A. As I said earlier, the power solution of basically turning off and turning back on the miners had two detrimental side effects, one was the potential for damage to the power supply unit on -- on the computing device. And the other one was that when we restarted it, it could take up to five minutes or so to reboot, and that was not -- it was not a well-controlled -- or it wasn't a very deterministic period of time.
Q. And you're the person who solved this, right?
A. Yes.
Q. So let's go to TX189. Now we're moving ahead in the time line now to August 20 -- August 28, 2018. So what is -- can you just tell me at a high level what is this document? What is demonstration day, what's it supposed to be?
A. We were scheduled to have a visit from SBI Holdings, which is a company out of Japan that was considering an investment in Lancium at the time. And this was an outline of the script that we were planning to use during their demonstration day.

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Q. And to make sure I understand, demonstration -- so you -- was this like a simulation that you had set up for SBI or was it they're coming to see what you've actually got in operation?
A. They're coming to see what we actually have in operation.
Q. And is SBI -- are they an investor at this time or did they become an investor?
A. They became an investor after this demonstration day.
Q. This was important that this worked, wasn't it?
A. Yes.
Q. And let me go to the bottom of this page. And it says "ramping demonstration with fire works," do you see that?
A. Yes.
Q. And let's talk in particular about "scripted walk to demo box representing project B." So was this a demonstration where you actually had container -- Bitcoin miners operating in a mining container?
A. We had JV Driver deliver to us a demonstration box. That box had two different types of racking systems in it, two different types of power distribution systems in it that we were using to test out to determine what we were going to have in our final design. And that was delivered to Thomas Road and we had miners operating in -- in that container for

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this demonstration.
Q. And so the project B portion of the demonstration was "turn off half the racks, maybe in a rack-by-rack cascade. Other half of racks still running in real-time to represent dynamic ramping capability."
Did you accomplish that?
A. Yes, we had about 120 miners on racks in our Thomas Road facility. We used those miners and the miners within the demonstration box to accomplish this. So we were able to turn on and off all the miners, ramp down all the miners and then ramp up all the miners, and then also ramp down a subset of the miners, followed by another subset of the miners and so forth, and then ramp up all of the miners simultaneously.
MR. NELSON: Can I go up in the slide -- in the document just a little bit to the Tier44 and ServiceNow portion. The highlighted portion near the top.
BY MR. NELSON:
Q. So can you explain -- it says: "Overview of the Lancium system Tier44 and ServiceNow intro with emphasis on scalability and platform."
Can you explain what you mean there and what this -- what the system is at this point?
A. So at this point we had directed modifications to the Tier44 and ServiceNow platforms and the integration of those

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platforms. And they were used to ramp individual miners -- groups of miners and all of the miners down and then back up.
Q. And how did -- how did Tier44 -- well, how did the Tier44 -- well, was the Tier44 software something you bought off the shelf or was it something that you had to modify?
A. It was the -- off the shelf, Tier44 was a software package that was used in traditional datacenters to manage traditional compute devices. And we needed to modify -- have the Tier44 system modified, which we specified, to be able to control miners and to send directives to -- to miners.
Q. And how did Tier44 and -- what was ServiceNow and how did it relate to Tier44?
A. ServiceNow is a system that does both a number of facets of asset management around computing devices, and also does what's called orchestration of a number of computing devices by executing either commands internal to its own platform or utilizing other platforms.
Q. So let's go to TX176 through TX180. So this is TX176. Now we're about a month after demonstration day.
Do you see that?
A. Yes.
Q. And so let's go down to Page 14628, near the bottom of the slide.

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So you see where it says: "Build and operational update. Box build," right?
A. Yes.
Q. So that was delivered, correct?
A. Yes, that was the demonstration box that I talked about earlier that was delivered to our Thomas Road facility.
Q. And it says "energized and operational," and you said it worked, right?
A. We used that during the demonstration day, yes.
Q. And it says: "JV Driver team and outside engineering convening in Houston next week. Finalize design spec on 5-megawatt device for delivery at the end of October."
Do you see that?
A. Yes, for the next 5 megawatts.
Q. And so this is -- who designed the demonstration box?
A. The -- the -- our engineering team working with Ready Engineering as our external engineering consultant designed to box and JV Driver fabricated the box.
MR. NELSON: So let's go -- on 176, let's go up a little bit more, or maybe it's -- maybe it's below. Yeah, there we go, okay.
BY MR. NELSON:
Q. So on Page 14628 and 629 it says: "NOC and offices now nearly complete."

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What -- the network operating center is the NOC?
A. Yes. So we built out the network operating system and some offices in the Thomas Road warehouse and were nearly complete at that time.
Q. And that -- that is -- is that geographically remote from where the miners are located?
A. In this particular case, the miners are located in the warehouse component of that location, and the NOC is in the same facility.
Q. But it's not -- the NOC isn't within the box itself with the miners, is it?
A. No, the -- the NOC would also coordinate multiple locations at multiple wind farms.
Q. So let's look at the next dash down, it says: "Ramping successful for full 120 miners in under five minutes up and down, less than two minutes down and less than four minutes up."
Do you see that?
A. That's correct.
Q. So is that the result of the demonstration day test that we talked about in the last exhibit?
A. Yes, it was.
Q. "Tier44 and ServiceNow systems now functional and running," do you see that?
A. Yes.

Q. And then it says: "ServiceNow and Tier44 pictures attached."

Do you see that?

A. Yes.

MR. NELSON: So let's go to -- let's go to page -- Exhibit 179. It's an attachment to this earlier -- to this e-mail.

BY MR. NELSON:

Q. So can you look at 179 and explain what is being shown here, the -- the picture?

A. So this is an example dashboard of a selection of different locations. Two of the locations here are intended to represent wind farms. And then the other two locations are actually our physical locations of the demonstration box, or as referred to here, the demonstration module, within our warehouse site. And then the -- the warehouse floor itself, referred to as Lancium Houston.

MR. NELSON: And so let's go to the next page.

BY MR. NELSON:

Q. What is being -- what is identified on this -- on this -- on this page of this ServiceNow software screen?

A. This is one of the input screens for ServiceNow that shows the type of information that we were keeping within the database of ServiceNow. It included things such as the manufacture of the miner and the miner model.

There was a name there that's highlighted that is an indicator of where that miner is located. LMF referred to as Lancium main floor. That means it was in our warehouse.

And then the numbers after that represented what rack, what shelf and what position on the shelf that particular miner sat on. So we would know if we needed to service that machine or do any other function to that machine. We would know exactly where it was.

Also, there's the network address, referred to as the IP address of that machine. And what the status is, in this case installed.

MR. NELSON: Let's go to TX180.

BY MR. NELSON:

Q. So what is this a picture of?

A. This is a function -- this is a picture of the Tier44 dashboard, and the Tier44 system was collecting information about the miners and controlling the miners through the modifications that we had made.

So down here you see, I think it's the 120 miners that we talked about. And the name of each miner, the serial number of each miner, what the IP address was, what the hashrate was at that point in time and a selection box.

Color green on this represents that it is

hashing at the expected hashrate. Yellow means that it's hashing below that expected hashrate for whatever reason. And there's a red one in there that indicates that it's not hashing.

Q. And this screen, this is actually a photograph of a running system, it's not a simulation, correct?

A. That's correct.

Q. And at this time, could you select off and on -- or select individual miners or groups of miners to hash or not hash as you wished?

A. Yes. So the mechanism you would use to do that is you could select the little radio buttons there to select an individual miner or groups of miners. There's a bottom down on the lower right-hand corner where you could select all of the miners.

Once you had selected a group of miners or individual miners, then you could click on the stop hashing. In this case, they're running so if you wanted to stop the hashing, you'd click on that and messages were sent out to those miners to suspend the hashing operation.

And in a similar fashion, you could select a group of miners and start hashing and messages would be sent out to those miners to start hashing.

Q. And was the system running at Thomas Road at this point, was it also monitoring the information that we

discussed earlier in connection with, for example, the '632 application?

A. It was monitoring some of the information associated with that.

MR. NELSON: Let's go to TX222 and 223.

THE COURT: Before you go on, I want to just ask him a couple of clarifying questions.

You talked about this Tier44 system and modifications that Lancium requested.

When did Lancium request those modifications?

THE WITNESS: We worked interactively with Tier44 to specify what our requirements were. We gave them the scripts that we had on -- had developed to suspend the hashing operations on the miners. That was the mechanism that was used to suspend the hashing operation.

We started working with them beginning of 2018 and worked with them I think until the end of 2018.

THE COURT: Okay.

BY MR. NELSON:

Q. Just to be clear, this was 2018, right?

A. Yes, 2018, 2018.

MR. NELSON: So let's go to TX222 and 223.

BY MR. NELSON:

Q. So now we're jumping to the timeline, October 11th, so this is now another month or so ahead.

What is shown on the right, TX223?
A. What's shown on the right is, in order for us to develop the dashboards that we wanted for operational use, we put together this set of the types of data that we would want to monitor and display on our dashboards. And, therefore, we would have to make sure that we retrieve that information from various different sources.
Q. And so let's look at -- so you'd conceived of monitoring this stuff -- you maybe weren't monitoring all of it at this point, but you conceived that you could monitor it?
A. Yes.
Q. So let's talk about some of that.
So on the right, you see coin price. That's Bitcoin price?
A. That's correct.
Q. Network hashrate and global hashrate?
A. That's correct.
Q. Network and global hashrate are the same thing, right?
A. Yes.
Q. S7 breakeven price.
What is that?
A. So S7 at that time was the previous generation of Bitmain miner S9 was, at that time, the current generation

of S9 miner.
By knowing what the hashrate of the miner was relative to the network hashrate, you could determine what your potential Bitcoin generation would be. And by knowing what the current price is, you would know, therefore, how much revenue you would except to receive for a given number of that type of miner.
And as long as the power price was less than or equal to that revenue generation estimate, then you would be either -- you would be profitable. If the power price was greater than that, it would not be profitable.
And S7 not being as efficient as an S9 would have a lower breakeven price than an S9. So they would have different breakeven prices and different profitabilities.
Q. Then you see miner status. Is that an individual miner-by-miner basis?
A. Both on an individual basis and on a collective basis. You know, how many -- the individual status of miners in terms of things like hashrate, whether it's running or not, and what the collective hashrate was of the miners, the power being consumed and so forth.
Q. And then looking at the bottom right, above the breakeven threshold, so you conceived at this time and basically knew how to figure out on a miner-by-miner basis whether it was above or below a breakeven threshold?

A. Yes.
Q. So going over to the left side, there's a ERCOT operating reserves, 4CP alerts, forecast loads, time stamps.
LMP, is that Locational Marginal Price?
A. Yes. That's correct.
Q. The plus five, ten, 15. Are those minutes?
A. Yes.
Q. So why are you thinking about monitoring those things? As a group, you don't need to go through them all.
A. These are all elements of the power system that might effect -- for instance, the operating reserves is the difference between the capacity and the demand on the system. As demand approaches capacity, it typically indicates that it's going to be a higher priced period on the electric grid.
4CP, in the terms of ERCOT, it stands for four coincidence peak. It's a mechanism that they use to determine what your transmission cost is for the following year, what your consumption of power is during the four peek periods during June, July, August and September.
So if you can avoid consuming power during those peak periods, you can reduce your transmission costs for the following year. And so we were -- we were looking at ramping down our power utilization during those 4CP peak periods.

Locational Marginal Price is referring to the real-time Locational Marginal Price which is the electricity at a driven location on the grid.
Q. Sorry. At a given node?
A. At a given node.
Q. So at this time, October 2018, to determine if it was profitable to mine at a given moment, what combination of dashboard data would be used?
A. So you would look at the Locational Marginal Price. That tells you basically what the price of power was. And then you would look at the breakeven price. As I explained earlier, to calculate the breakeven price, you need to know what the exchange rate is of Bitcoin, what your hashrate is and what the network hashrate is.
Q. And at this point, if the cost of power was more than the mining of revenue, would Lancium mine Bitcoin?
A. No.
Q. And if the revenue of mining was more than the cost of power, would Lancium mine Bitcoin?
A. Yes.
Q. Would also -- was it -- you also understood that it might be profitable for some generations of miners or manufactured miners to mine and others not; is that fair?
A. That's correct. The older generations would be less efficient and would have different breakeven price.

Q. So you understood that you might have some miners mining and others miners not mining depending on what the power price was?
A. That's correct.
MR. NELSON: Let's go to TX781.
BY MR. NELSON:
Q. And what was the SBI site visit?
A. That's the demo day that we referred to earlier.
Q. Okay. Let's go to page 21495.
So you see the par 4 test on the right side there?
A. Yes.
Q. Can you explain at a high level what the par 4 test was.
A. Par 4 is a piece of equipment that we obtained from Tier44 that basically has a small power distribution unit connected to a meter measuring the amount of power draw or actually the amount of amps drawn by whatever devices are connected to that power distribution unit.
Q. So explain what this test was run on.
A. So this was run -- this is the result of running a single miner connected into that power distribution unit and sending signals to that miner to ramp down and then ramp back up.
So as we look on the left-hand side of the

chart, we see that there's a period of time where it's basically running at full power, drawing the maximum number of amps. And just before or around 95 seconds, just before that, we issue a software command or a command to the miner to execute a script locally that suspended all of the hashing functions and watchdog timers, that I described earlier --
Q. So then you drop down to just a very low power state.
Is that the low green line around sort of 1 amp, 2 amps?
A. Yes.
Q. I guess it's 1 amp.
A. Yes.
Q. So then what happens around the 194 second mark to cause the graph to change on the right side?
A. We send a command to the miner to basically restart the hashing functions. And what you see there are a number of the functions restarting on the miner, resulting in the large increase there, which is when the -- all of the hash boards are fully hashing.
And that time frame takes about 90 seconds at this point in time.
Q. So let's go to --
THE COURT: Let's take a break. Let's take a break now. 20-minute break.

(Break taken.)
THE COURT: All right. You may be seated. You can continue.
BY MR. NELSON:
Q. So Dr. Cline, can you look at page 21534 of Exhibit 781, which is up on the screen. Looking at the portion on the right where it's talking about total cap ex, what's being discussed there?
A. That's a combination of how much capital expenditure we had to date and what our estimation was for completing the first container.
Q. The mining container with JV Driver?
A. Yes.
Q. And so look at the third bullet point down on the left side, "On an apples-to-apples basis, Box 1 would likely come in at around $230,000 within 10 to 15 percent of our forecast."
Do you see that?
A. Yes.
Q. What size box was that?
A. This was a 2-megawatt box.
Q. And roughly, how many miners would be contained in that?
A. I think it was 1,428, just under 1,500.
Q. Can I go -- hang on here. Let me go to TX360.

So this document is dated December 20, 2018. We're now moving up another month or so in our timeline.
So can you just at a high level describe what this document is.
A. So our external engineering support, Ready Engineering, when they submitted their invoices, would provide progress reports. This an example of one of those progress reports.
Q. And it says "monthly."
So you got these every month?
A. Yes.
Q. And let's go to page 24979. I think I asked you how many miners were in the box.
Does that document confirm how many miners were in this box?
A. Yes, 1,428 and about 2 megawatts for consumption.
Q. And how many kilowatts was that?
A. 2,000 kilowatts.
MR. NELSON: Can I get TX330 and 331.
Q. It's another Ready Engineering document, correct?
A. Yes.
Q. And this one is titled "Lancium's Datacenter Control Narrative Draft."
Do you see that?
A. Yes.

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Q. Can you explain sort of how that's different than the monthly progress reports.
A. The monthly progress report is an overview of a number different parts of project that are being coordinated in conjunction with Ready Engineering.
This document is the documentation around our datacenter control, what elements are included in that datacenter control, and how those elements are going to be executed.
Q. And as far as discussing the elements that are in the datacenter control, where does that information come from?
A. That information comes from me and my team, our engineering team, and in working in conjunction with Ready Engineering.
MR. NELSON: So let's go to TX344, TX345 and TX346.
BY MR. NELSON:
Q. And I want to focus on you TX344 -- so now we went back in the timeline just a bit. I want to go to TX345 at 24902.
You see in the upper left near number one, it says: "Tier44 to integrate its automation platform into the mining environment to replace shell scripts with a broadcast mechanism for faster on/off capabilities."
What is that referring to?

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A. We had determined around this time that the Tier44 system, which was using sequential messaging to miners, was fairly inefficient and was not meeting our target for ramp down and ramp up time frames.
So we wanted them to replace the control loop at that time, which was sequential, with a broadcast mechanism so a message could be sent out to multiple miners simultaneously to turn off -- to ramp down or ramp up. And by communicating to multiple miners simultaneously, that would make it more efficient and reduce the total ramp time, either down or up.
Q. So let's look at pullout number 4.
"Tier44 to implement power price availabilities based on adjustment of mining capacity."
What is that referring to?
A. So there are two elements of this, what is the total amount of power available from the wind farm. And then the power price element looks at two things here as sub bullets that the NS9 miner, for instance, was more efficient than an S7 miner, therefore, they would have different breakeven prices. And we would want to curtail the use of an S7 at a lower price point than an S9.
Q. So it's now the implementation of what we talked about earlier when we had that spreadsheet a couple of months back when it was looking at breakeven prices on a

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miner generation by miner generation level?
A. Yes.
Q. Okay. So let's go to TX291.
What is this -- what is this document? The format is different from some of the other ones here.
A. This is a message in one of our Slack channels. Slack is an internal messaging platform -- is a messaging platform that we use internally to coordinate our work activities.
Q. And it says: "Testing now shows capability to ramp miners from hash stopped to all hashing in approximately 90 seconds, down from around 20 minutes for all miners, 12 minutes for 75 percent."
Do you see that?
A. Yes.
Q. So if I understood correctly, you were ramping in under a minute, maybe under 2 minutes, for an individual miner, but here it's saying 20.
Can you explain what's going on.
A. So the measurements that we had on the par 4 were for an individual miner. And then the demonstration we had earlier were for a 120 miners. We're now controlling 1,200 miners. And because the Tier44 system was using a sequential set of messages being sent out, it was very inefficient and it was nowhere close to what we wanted.

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So we wanted to basically get a baseline on how quickly that could be accomplished and give Tier44 one last opportunity to improve their efficiency. So we used a platform called Awesome Miner, which is a miner manager platform, but it had the capability of sending out messages simultaneously to a number of miners.
In using that, we were able to show we could accomplish that in 90 seconds.
Q. So what is the significance of this?
A. The significance of this is that the Tier44 system was highly inefficient, and because of that, we ended up terminating the contract with Tier44. And at about this time we started a skunkworks project to develop our own software.
Q. Why didn't you just use the Awesome Miner that you used during this test?
A. Awesome Miner is a miner management software. It was not -- it was not really intended to perform this function and we felt that by developing our own software, we could integrate a number of other functions that we wanted into the platform.
Q. So let's go to TX501. So now we're jumping up into now April 22nd, 2019. Turn to Lancium 30609.
And this is Vitor Henrique writing: "Is there a way to get LMP value through API instead of tables?"

Why was Vitor asking that question to ERCOT in this case?
A. So we had begun the development of our internal software and Vitor was the main programmer on that. At the time, we were pulling information from websites and tables on the ERCOT website. And I directed Vitor to reach out to ERCOT to see if there was another mechanism that we could use to retrieve that information. And using an application program or an interface, an API, would be less prone to errors and would also be more deterministic in terms of how quickly we could retrieve the information.
Q. Let's go to TX320. Now we're at May 2, 2019, and the Lancium data control document is dated May 1, 2019; is that right?
A. That's correct.
Q. So let's go to 243 -- well, this is a -- this is sort of a further -- I guess, iterative version of the Lancium control document we looked at earlier; is that right?
A. That is correct.
Q. So let's go to 24330. So can you describe on there -- it says "section 5.3.1 load management Lancium."
Can you describe what this section is talking about.
A. Yes, we had gotten far enough along in our software development that I felt that it was the platform that we

wanted to use as the primary platform for adjusting our power utilization. And so you see that they referred to as software load control. That's indicating the use of our software to adjust ramp up and ramp down, for the miners to respond to an available power limit communicated from the wind farm.
We needed to make sure, however, because we were operating in a wind farm and we could not consume more power than what the wind farm was producing, that if for some reason our software did not perform within a certain period of time to hit the new targets that were given to us, that we needed to make sure that we stayed at or below the threshold target that was given to us.
So the backup mechanism was the hard load control, which we've referred to earlier. In this case, it was a breaker to turn off an entire datacenter.
Q. And so the soft load control, the software that is operating at this time, thinking back to the dashboard exhibit, is the software monitoring other things besides just the signal from the wind farm?
A. Yes, it's, it's monitoring the signal from the wind farm. It's also retrieving information from ERCOT websites and then later on through an API -- actually, I think we had the API information by this time.
Q. What -- and what's it doing with this information?

Is it getting information also about the individual miners themselves?
A. Yes, it's getting information about the number of miners that are operating, what their hashrates are. And we could see what the individual miners were reporting in terms of their power utilization. But there's also a meter between the wind farm and our set of datacenters that we would monitor to determine what the actual power utilization was.
We also would monitor Bitcoin price, real-time power price and a number of the things that you saw on the dashboard earlier.
Q. The hashrate, the block height, those things?
A. Hashrate, both individually and aggregate of all the miners.
Q. And what did -- what did your system do with that information?
A. So the information on directives from the wind farm would tell us what our target was in terms of the amount of power that could be utilized, but then the additional information on economic concerns, reliability concerns and operational elements would be used to determine what the actual target utilization would be.
Q. So you basically used that information to determine a target power level?

A. Yes. And then using that information, we would translate that into a set of directives that we would send -- or instructions that we would send to the computing devices to suspend or restart their hashing algorithms.
Q. Either some or all?
A. Yes.
Q. Let's go to 24330 and 331, the bottom of this page, the top of the next one.
So load management coordination power provider communicated control signals. You see it says "received by the Lancium brain."
What is a Lancium brain?
A. That is the software that we were developing or that we had developed. It had several names. I think it's been referred to as the Lancium monitor system, the Lancium brain, the Lancium fit. It eventually became known as Lancium Smart Response.
Q. Let's go to the table on 29331. So can you just walk through the three elements here on the left side of the table, load limit set point, load limit compliance period, metered load, and describe what these are.
A. So the load limit set point is the amount of available power that we have to consume from the wind farm, the maximum allowable electric load. And that would change over time depending on the output of the wind farm. And

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when a change occurred in that, we would need to use the soft load control and potentially the hard load control to assure that the new set point we stayed at or below that threshold.

First using soft load control, but if that did not -- if that, for whatever reason was unable to achieve the new target set point within a period of time, we would then kick in hard control to assure that we did not cause any imbalances with the electrical system at the wind farm. And we would be monitoring in real-time the amount of load that we were pulling from the wind farm to know exactly what the total load was that we were consuming.

Q. And did you monitor the power consumption of your system as well as the real-time?

A. Yes.

Q. And let's go to section 5.3.5, page 24332. So what is being discussed here in the highlighted portion beginning the load limit set point value?

A. So the value, once received, is evaluated and we determine what strategy we need to use to use our -- within our software to re -- either reduce or increase the number of miners hashing to stay within, first of all, that availability. And then taking into account any other considerations, economic, reliability or operational considerations, that might reduce the amount of power that

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we're going to consume.

Q. So at this point your behind the meter still?

A. Yes.

Q. And you're given a set point by the wind farm; is that right?

A. Yes.

Q. And you can operate at that or you can operate at less than that, right?

A. That's correct.

Q. And it's your decision?

A. Yes.

Q. And if you're going to operate at less than the maximum power, what considerations are you deciding in forming that strategy?

A. So one is economic considerations, whether the price that we had agreed to pay for power from the wind farm was greater than the revenue we would receive for Bitcoin mining. In which case we would reduce the amount of power that we were using and ramp down miners.

The other considerations would be contractual, that if the real-time price of power was above a certain level, we would have in our agreements whether we were to curtail the use of power. So the wind farm could sell the power back out to the grid.

Then on reliability, there might be issues that

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arise when there's a -- say, a turbine goes offline or we have a problem with our computation devices or communication device that would change the amount of power that we were using. Operational considerations are more on a planned-outage-type basis so that we would know that some maintenance was going to be accomplished on the wind farm or on our systems.

Q. Let's go to TX168 and 169.

Now we're at May 7, 2019. So can you tell me what this document is?

A. Yes, this is a -- this is a document that describes our -- a description of our ramping.

Q. Okay. So let's go to TX770. So this is May 9th. This is 8 days after the discussion that we just had about Exhibit TX320. And this is the e-mail that Mr. McNamara forwards to you and Mr. Kutscha and Mr. Cohen from Austin Storms; is that right?

A. That's correct.

Q. Do you remember receiving this document?

A. I remember receiving this document vaguely. On further review, the document looked familiar to me.

Q. Do you know why Michael -- Michael McNamara forwarded it to you?

A. We were having discussions with a number of different container manufacturers looking for different sizes,

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configurations and so forth of containers. So as he points out here, he's indicating that there is a box, meaning a container described in the attachments, although he points out that it's fairly expensive.

Q. What did you do with the document when you received it?

A. So I opened up the specification sheets in the product detail to determine what the configuration was of the container and what the cost of the container was.

I found that the container was designed to hold --

Q. Well, we can look at the document in a minute here.

How long do you think you looked at this document at the time?

A. A couple of minutes.

Q. All right.

MR. NELSON: Let's look at the first attachment here, the product spec attachment and blow that up a little bit.

BY MR. NELSON:

Q. And let's talk about this in comparison to the JV Driver box that Lancium was designing with JV Driver?

So what's the dimensions of Mr. Storms' box here?

A. This is a 20-foot container. The JV Driver box was a

40-foot container.
Q. What's the maximum electrical load of this box?
A. 373 kilowatts.
Q. What was the electrical load you were looking at with JV Driver?
A. 2,000 kilowatts, 2 megawatts.
Q. So four and a half times bigger?
A. Yes.
Q. How was the JV Driver box to be cooled?
A. It was with air cooling but also had a misting system for swamp cooling, as it's referred to.
Q. How many miners -- so go gown to the total design hashrate.
How much miners was the JV Driver box to hold?
A. 1,428.
Q. Did the JV Driver box include the miners?
A. No, it did not include the miners.
Q. So just like this one, it did not include the miners, right?
A. Right.
Q. Did the JV Driver box include exterior electrical infrastructure or transformer?
A. We had the option of providing a transformer on the skid but we were looking at just the box configuration itself in terms of the cost of manufacturing.

Q. And so this box was about 95,000 after taxes, right?
A. That's correct.
Q. And the JV Driver box, if I remember right, was about 200, 230,000, give or take?
A. Yes, and we estimated between 200 and $300,000.
Q. But the JV Driver box was about five times bigger?
A. Yes.
Q. So looking at the specification -- and I don't know -- you can correct me, I don't know if you recognized this at the time or if it's been afterwards, but did -- is there any indication here on Mr. Storms' specification that it is electricity certified UL CEL, I think it is, whatever the electrical certifications are?
A. No, there was no indication of that. There's also no fire control system associated with this box and there is no secure entry monitoring associated with the box.
Q. Are there any other sort of details or lack thereof that jump out at you compared to the JV Driver box?
A. The -- well, basically, from what we've just discussed here and the fact that on an apples-to-apples basis in terms of the amount of power we would want to consume or the amount of miners that we would want to support, this box was about five times the cost. I didn't spend a lot of time on this.
Q. I think I probably asked you this earlier, but the

certifications, the safety issues, the fire suppression, do those things matter?
A. They matter. The requirements oftentimes of the wind farm in order to meet their specifications of anything that is put -- installed on their sites.
Q. Did you ever reach out to Mr. Storms to ask him why -- whether this was certified or things like that, to find out that information?
A. I saw no reason to reach out to Mr. Storms. There wasn't anything here of interest.
Q. Did you open the spreadsheet when you received this e-mail from Mr. McNamara?
A. I don't recall opening the spreadsheet at the time that I received the e-mail. I did open the spreadsheet after we received notice of the lawsuit. And that was, to my knowledge, the first time I looked at the spreadsheet.
Q. Did you discuss the contents of Exhibit 770 or any of the attachments with anybody at Lancium?
A. No, we were looking at a number of other options and this was not competitive with anything that we were looking at, so there was no reason to discuss it.
Q. Are you aware of anybody at Lancium doing anything with respect to this document or anything in the attachments?
A. Not to my knowledge.

Q. So was there a time, after the date of this document, when Lancium became interested in demand response programs?
A. Yes.
Q. And I think we'll probably hear more about this from Mr. McNamara, but can you give me a really high-level summary why that is or how that came to be.
A. There were a number of discussions and we came to learn about the ancillary services within ERCOT, the first of which was load response. And we moved forward with conversations with the qualified scheduling entity, QSE MP2, to install that capability in our Thomas Road facility, again, as part of your research and development and testing efforts. And then from there we progressed to other ancillary services as well.
Q. So let's go to TX981 and 982. This is now August 26th and the --
MR. NELSON: Can you pull up the attachment as well.
BY MR. NELSON:
Q. So can you explain what the document here is showing, the attachment? What's ADK, underscore, LD1 in column A?
A. So when you enter into an ancillary service program, you have a resource designation from ERCOT. This is our resource designation. It's basically how ERCOT knows our location. It stands for addicts load one.

Q. So this is Thomas Road?
A. Yes.
Q. And the numbers one ultimately through 24 beginning in column C and going to the right, what are those -- what are those?
A. Those represent the hours in an operational day. And ERCOT uses what's called the hour-ending specification, so midnight to 1:00 a.m. is hour ending one. One, in this case, in the spreadsheet. All the way through hour-ending 24, which would be 11:00 p.m. to midnight on that day.
Q. And you see the awards there, 0.5 in column C. Jump over to column M, it's 0.4.
What are those so?
A. Through our QSE, we would offer in an amount of power that we were willing to participate in the load response program. And there were a number of entities that were offering in power into this load response program. And several of them, including ourselves, or many of them including ourselves, would offer in what's known as a price taker, which means we would offer that to ERCOT for use at whatever the price for -- settled for the ancillary service.
Because there was an oversubscription or there were many offers, ERCOT would reduce the amount of award that you would get, that they would in essence agree to use. And so to give an indication of the numbers, we would offer

in about 1.6 megawatts for every hour of the day. And this is showing we got different award amounts, a half of a megawatt, four-tenths of a megawatt, six-tenths of a megawatt, at different hours of the day. And that's what the award is.
Q. And look at LMP.
What is LMP?
A. LMP in this case is a little bit of a misnomer. We were working through the details with our QSE on communicating this information to us. But what it represents in this spreadsheet is actually the price per megawatt that was being -- had been settled for this particular ancillary service.
So hour ending one, we were awarded a half megawatt, and the price for that ancillary service was $1.20 per megawatt.
Q. So let's go to TX526 through 529.
So this an e-mail from you to Mr. McNamara, correct?
A. Yes.
Q. And you say: "An important point which didn't come across in our conversations."
What conversations are you referring to?
A. So we had conversations internally and also with the QSE, in this case MP2, about the load response program. And

this shows that we were learning more about the details of that program as we had those conversations.
Initially, it was portrayed to us that in order to participate in this program, we had to have installed what's called a shunt trip. That shunt trip is remotely controlled by ERCOT, the grid operator, to basically, when needed, disconnect our load from the grid. So dropping our total power consumption to zero.
And it was portrayed to us that to participate in this program, all you had to do was get the shunt trip installed. The QSE would offer in your load and we would just, basically, collect revenue for giving ERCOT the option to turn off our load in times of need.
Q. But you wouldn't get that -- you wouldn't get the -- so if we go back to the last spreadsheet, for example, if you at Thomas Road -- if you were offering 1.6 megawatts, which I think was the Thomas Road, and you only got 0.5, what happened -- if ERCOT tripped the shunt, then you got turned off for all 1.6 megawatts, right?
A. Yes, we got turned off for all 1.6 megawatts, and -- and that was something that we were able to control our load at this point in time through our software. So we entered into conversations with MP2 about using our software in a similar fashion to the soft load control and hard load control that we talked about on the wind farm.

But in this case, we had to maintain -- using the example here of hour one, we had to maintain the consumption of one-half of a megawatt, 0.5 megawatts. And -- but that if we were dispatched by ERCOT, we could use our soft load control to drop that amount of power, and that, if for some reason we did not attain that target, MP2 could then trigger the shunt trip.
Q. So let's go back to 526. So you -- you say that is -- is that the award is essentially an obligation on our part that we consume the amount of power that ERCOT could curtail?
A. Yes.
Q. Is this when you kind of came to that understanding?
A. Yes.
Q. Now, is that -- this is now grid connected, is that different, philosophically, than you were doing before?
A. It's an entirely different concept of operation. On the -- behind the meter in the wind farm we had a maximum amount of power that we could utilize to make sure we weren't consuming more than what the wind farm was producing.
In this case, there was a minimum amount of power that we had to consume. And we couldn't go below that, so that that power was available for ERCOT to dispatch at -- at their option.

Q. Near the bottom you say: "We were working to automate processing of the spreadsheet we received from MP2 and we will try to automate notifications, if possible. This is a bit more complicated than we originally understood, but we will adapt."
What do you -- what do you intend to convey there?
A. What I wanted to convey was that it was a lot more complicated than we just install a shunt trip and -- and we get a revenue source. That there was a commitment that we had to maintain. And that if we were going to do anything like economic dispatch or something like that, we had to assure that we stayed above that commitment level in terms of our power consumption.
So that required us, on a daily basis, to get information from the QSE on what our awards were and -- so that we could put that into our system. And then if we were dispatched, we wanted to make sure that we were notifying our operational elements that there had been a dispatch.
Q. So let's go to TX310. You write to Tim: "We were adjusting our economic curtailment plans to assure that we consume the obligated load we had been awarded."
Do you see that?
A. Yes.
Q. What did sort of the realization of how this -- so what did the -- the realization of the idea that you had to -- that you had to consume this much power, what did that -- how did that affect your thinking?
A. So, using the numbers that we talked about earlier, if we were offering him 1.6 megawatt and we were awarded a half a megawatt we had to maintain that amount of power consumption. If we were in a period of high price on -- high price on the electric grid, we could curtail utilizing 1 -- 1.1 megawatt2, about a megawatt, for economic considerations. But we could not curtail that half a megawatt, we had to maintain that power consumption.
Q. Even if you were losing money?
A. Even if we were losing money.
Q. So let's go to TX595. So this is from Vitor, September 4th: "I automated our dashboard with the input file so we can track it on our operational dashboard."
What does that mean?
A. So we worked out with MP2 that they were going to on a daily basis send us the awards. So offers go in the Day-Ahead Market in the morning, ERCOT settles those markets in the afternoon, the -- the QSE is notified of what the awards are, and then they would send us a spreadsheet of the amounts of power that ERCOT was purchasing an option on for the program and what the price was.
So we would basically transfer the data from the spreadsheet on how much power we needed to maintain per each hour into our system. And then we would use that both in logic and also on our dashboards to show us how much power we needed to maintain consumption of in order to fulfill our requirements to ERCOT.
Q. So let's go to TX298. Can you just briefly describe what this document is?
A. This is a document -- I started to -- I -- I put together to document elements of what we understood at the time of the demand response program and how we would offer in, get information back, ingest that information into our system and operate during the -- the real-time Market. The second part of it is looking at a different type of response, which is called frequency response.
And so this document was basically to make sure that, one, I understood at that time what it was we -- we needed to accomplish. And that I could communicate that to my team so that as we were operating the system and as we were developing additional software, we knew what we needed to do.
Q. So going back to what you said before about the shunt trip and it curtailing -- you know, if you were curtailed by ERCOT, you ended up curtailing everything, how did that realization ultimately lead you to developing CLR or becoming a controlled load resource?
A. So we realized that, one, if ERCOT was buying the option to curtail a half a megawatt out of our 1.6 megawatts, that when they wanted to curtail that, we could do that through our software with a backup of the shunt trip. And that would have less stress on our systems.
And we also realized that we could dispatch the balance of the power that we were using for other considerations such as economic considerations.
So we wanted to get an agreement with our QSE, MP2, that we be allowed to do that with the backup software control, with the backup of the shunt trip. And we went to their offices and we demonstrated to them in real-time our ability to ramp down and ramp up our load.
And there were two things that happened out of that meeting: One is that they agreed with the backup of the shunt trip where we could do the -- the software control. And then the second thing was they looked at the performance that we had and thought that we might be able to qualify for another type of resource designation, what was known as Controllable Load Resource.
Q. And did you eventually qualify for the Controllable Load Resource?
A. Yes.
Q. To your knowledge, were you the first one?
A. In June of 2020 we passed the ERCOT qualification as

a Controllable Load Resource. And, to our knowledge, we were the first load-only Controllable Load Resource within ERCOT.

MR. NELSON: And can I get TX167.

BY MR. NELSON:

Q. And this is the -- look at -- you're the Raymond Cline on TX 1 -- you're the inventor here, right?

A. Yes.

Q. And this is the provisional application that led to this '433 patent at issue here?

A. Yes, it is.

MR. NELSON: And pull up Exhibit 1, please.

BY MR. NELSON:

Q. And that's -- the '433 patent is Exhibit 1, correct?

A. Yes.

Q. Do you believe Mr. Storms should be the named inventor on this patent?

A. No, I do not.

Q. Why not?

A. During our development of this patent, I had no knowledge of Mr. Storms, no knowledge of his work, I never communicated with Mr. Storms. And through the process of this litigation, I have seen nothing that indicates that Mr. Storms fulfills all the requirements as specified in the patent.

MR. NELSON: So before we end here, there's some notebooks up there with some other exhibits that you've looked at. And since they are not -- these exhibits are not objected to, I just want to get -- get him to verify that he's not -- knows them and then I want to move exhibits in.

BY MR. NELSON:

Q. So can you look at TX266, and just let me know if you've seen it before. Actually, maybe I'll do this, would you just look through -- look through the notebooks generally and confirm that you've seen the exhibits and you're familiar with them, and maybe we'll just move them all in at once along with the ones that -- that we referred to here in the outline.

MR. NELSON: Just for the record, a lot of them are, like, the -- the ready engineer reports that we've referred to, the ones that are in between the ones that we used as exhibits. And some other things.

THE COURT: Okay. Any objections?

MR. HORTON: Yeah, Your Honor, we object to the extent that Dr. Cline is not going to say anything about these documents. We don't mind moving exhibits in at the end of his testimony, to the extent he testified to them. But I -- I don't agree that he can just sort of push a bunch of documents in the record.

MR. NELSON: Well, I think I've laid the

foundation for them, and these aren't objected to. Counsel -- both sides agreed they are admissible.

THE COURT: If he hasn't testified about the document in any manner, that's their objection.

MR. NELSON: Yeah, I understand that. But, Your Honor, we -- you know, we're asked to basically show development of 20 separate claims in eight hours, as well as defend against Mr. Storms' stuff.

None of these exhibits are objected to. Like the Ready Engineering ones, for example, I think I laid a foundation of those, those are -- there's a whole slew of these reports on this page that are the same daily -- the monthly reports, and other versions of that overview. So I guess I --

THE COURT: Okay. So why don't you just take them as a group, I mean.

MR. NELSON: That's what I was trying to do. I guess -- okay, can you look at the Ready Engineering ones, real quick. So it would be TX191 through 195. They should all be in the same binder.

BY MR. NELSON:

Q. And just confirm that you are familiar with all of the Ready Engineering ones that are in that binder.

A. Yes.

Q. There should be another one that is other technical

documents, a TCPIP and Python e-mail, a base load design document, communications between you and Vitor, which we've talked about some of them in the e-mail -- in the -- during the testimony regarding the MP-awarded power, and a discussion of -- further discussion, I think, of demo day that was -- that we talked about.

A. Yes, I'm familiar with those documents.

Q. There's another one that is an ERCOT market participant agreement, Exhibit 711 and 712, are you familiar with Lancium becoming an ERCOT market participant?

A. Yes. In fact, I filled out a version of one of those applications.

THE COURT: So, Mr. Nelson, in addition to asking him if he's familiar with it, you might want to ask him what is it.

MR. HORTON: Your Honor, he might also want to look at it. He's sort of not even looking at them.

MR. NELSON: Counsel, you didn't object to these exhibits. I mean, I appreciate the need, but you're going to try to make me burn a half an hour for exhibits that you didn't object to at all.

MR. HORTON: I didn't object to them being on your exhibit list --

MR. NELSON: You didn't object to them being admissible, Counsel.

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MR. HORTON: Your Honor, we -- we didn't object to them being on the exhibit list, but that wasn't permission to introduce them in evidence in bulk with the witness not even looking at them.

MR. NELSON: He's looking at them now.

THE COURT: So direct your comments to the Court.

MR. NELSON: Sorry, Your Honor.

THE COURT: But they didn't object to them. And I understand that you have limited time, but you do got to have him at least testify to some extent about the documents so that he's familiar with it, he knows what it is, and gives us quick summary of what it is.

MR. NELSON: Okay.

BY MR. NELSON:

Q. Okay. So let's do it this way, Dr. Cline. So pick up the Ready Engineering notebook, please.

A. That's the first notebook.

Q. Okay. So TX191 through TX195, can you confirm that those are Ready Engineering report documents and that you are familiar with them?

A. Yes, 191 is an e-mail and some attachments that I'm familiar with describing some meeting schedules. 192 is a design document from Ready Engineering, which I have reviewed and made comments to.

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The 193 is another Ready Engineering design document -- well, it's a design document received from a fabricator or -- that was working with JV Driver and I've reviewed and had input into that.

194 is a description of the fire suppression system options and summary, which I've reviewed and had input into.

195 is the Lancium datacenter control narrative draft, one of them that we discussed.

Q. So the next ones are 204 through 208.

A. 204 is an exchange of e-mail from our finance department and includes Ready Engineering. I am familiar with that document and I've reviewed it.

205 is a Ready Engineering progress report and I've reviewed those multiple progress reports.

206 is an invoice that shows the charges for work done by Ready Engineering and I've had -- I've reviewed those.

207 is another progress report from Ready Engineering, which I've reviewed.

208 is an invoice from Ready Engineering, which I've reviewed.

210 is a substation connection document from Ready Engineering which I've reviewed. And --

MR. NELSON: Let's stop there. So 210. Go to -- go to TX356.

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A. Let me coordinate notebooks here. E-mail from Ready Engineering with a progress report that I have reviewed.

Q. So let's go to a different group of documents here, TX354 and 355.

A. 54?

Q. Yeah, 354 and 355.

A. 354 is a document about container design that I was copied to and reviewed.

TX355 is a diagram of network communication intended for a -- the Thomas Road site, which was performed by my group at my direction.

Q. Let's go to TX329.

A. 329.

Q. Yeah.

A. Oh, okay.

This is an e-mail between Ian Rock, Vitor Henrique and myself talking about the Lancium control narrative. And I was copied too on that.

Q. Let's go to TX56 and 57.

A. TX56 --

Q. 56 and 57.

A. Back to the first one.

So TX56 is an e-mail between Eric Kutscha and Matthew Gasparo. I'm copied too on this e-mail and I've reviewed it.

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57 was an attachment to that e-mail I believe, which describes an overview of our operational control system.

Q. Let's go to TX109.

A. TX109.

Q. 109, yeah.

A. The next document I have in my binder is TX162.

Q. It's up on the screen. Why don't you do it that way?

A. Okay.

Q. Are you familiar with this document?

A. Yes. This is an e-mail that I wrote to Vitor and Ian and Thomas Salvatore.

Q. Let's go to TX282. Maybe it's just easier to pull them up.

Are you familiar with this one?

A. Yes, this is an e-mail that I wrote to Michael McNamara copying some of our contacts at SBI.

Q. Let's go to TX266.

A. TX266 is a presentation that I've reviewed and had input into.

Q. Let's go to TX282. Oh, I already did this one.

MR. NELSON: So, Your Honor, I move that we move into evidence the group of exhibits that I just read as well as TX162, TX201, TX211, TX277, TX301, TX332, TX356, TX363,

TX364, TX368, TX369, TX426, TX427, TX428, TX429, TX430, TX432, TX433, TX468, TX567, TX568, TX569, TX570, TX579, TX582, TX583, TX585, TX709, TX712, TX754, TX756, TX757, TX758, TX759, TX763, TX764, TX765, TX778, TX787, TX790, TX972, TX976 and TX977.

MR. HORTON: Your Honor, they might have be somewhat out of order, but to the extent those were all the exhibits that were discussed with Dr. Cline, no objection.

MR. NELSON: And Your Honor, just to request in case I missed one, we'll have try to come back and try to get it admitted later, but I think we got them all. Thank you.

CROSS-EXAMINATION

BY MR. HORTON:

Q. Good afternoon, Dr. Cline.

A. Good afternoon.

Q. I heard you say a little while ago -- before that we heard a lot about a little. There were some things you talked about that were in the documents that I didn't quite see in the documents, but we'll have a chance to look at that in post-trial, I think.

One stuck out to me, though. If we could look at TX163.

Do you recognize this document?

A. Yes, I do.

Q. This is the '632 application, right?

A. This is the patent.

Q. And Mr. Nelson asked you some questions about the '632 application, didn't he, just now?

A. Yes, he did.

Q. And I thought I heard you say that the '632 application teaches monitoring Bitcoin price.

Did I hear you right?

A. I -- I said it -- that monitoring Bitcoin price was one of the economic considerations.

Q. But you're not saying that the '632 application actually includes the words "Bitcoin price," are you?

A. I can look through it if you want, but I believe my statement was that the economic considerations included Bitcoin price.

Q. Just to be clear, Dr. Cline, are you saying that the words "Bitcoin price" are in the document or you're saying the words "economic considerations" are in the document?

A. I believe the document would talk about economic considerations. I can look through the document in its entirety if you want me to check.

Q. Dr. Cline --

A. -- the language.

Q. Dr. Cline, I think I also heard you say that the '632 application, TX163, teaches monitoring Bitcoin mining

profitability.

Did you say that?

A. As part of the economic considerations, yes.

Q. So again, we're just on those two words, economic considerations, right?

A. I believe so, yes.

Q. Dr. Cline, do you believe that you invented ancillary services?

A. No.

Q. And Dr. Cline, you don't believe you invented CLRs, do you?

A. No.

Q. And you didn't invent demand response, right?

A. No. Demand response is a general term used in electric power systems.

Q. And you didn't invent the rules governing demand response programs within ERCOT, for example, right?

A. Those are all specified by ERCOT protocols.

Q. And those ERCOT protocols have been around for a couple of decades, haven't they?

A. Yes, and they change and they continue to change.

Q. Dr. Cline, Bitcoin profitability includes consideration of hashrate, difficulty, Bitcoin price and the price paid for power, right?

A. Could you state those again, please.

Q. Sure. Bitcoin profitability includes the conditions of hashrate, difficulty, Bitcoin price and the price paid for power, right?

A. Yes.

Q. Dr. Cline, I recall in your testimony you mentioned you worked for a company called SAIC.

Do you remember that?

A. Yes.

Q. And you're aware that when you were working for SAIC, SAIC was sued for a breach of a NDA, correct?

A. That's correct.

Q. And you were involved personally in that action of that lawsuit, weren't you?

A. I stipulated that in my deposition, yes.

Q. And the information that was alleged to have been improperly used, breaching the NDA, was about software, wasn't it?

A. Yes.

Q. And it was about software in the energy space, wasn't it?

A. That was the allegation, yes.

Q. And in fact, you were the chief technology officer of the commercial energy group of SAIC when that lawsuit was filed, weren't you?

A. Yes.

Q. You were alleged in that lawsuit to have received verbal communications and presentation materials from the plaintiff in that case, weren't you?
A. I believe that's so, yes.
Q. I'd like to direct your attention to TX223, please. This is one of those documents where I think I heard a lot about a little, Dr. Cline.
You said this is a dashboard, right?
A. This is documentation of elements that we were -- we were considering as requirements for our dashboards, yes.
Q. And a dashboard is nice graphics, it's meant for someone to look at, right?
A. It's -- this was intended for our network operation system -- our network operation center where our network operators would be looking at and monitoring the dashboards.
Q. Those are human beings, right?
A. Yes.
Q. And one of the things I remember you speaking about was miner status.
Do you remember answering questions about miner status?
A. I do.
Q. I thought I heard you say that miner status is disclosed in TX223, includes individual and collective miner status.

Do you remember saying that?
A. Yes.
Q. Does it say that here?
A. It doesn't say that explicitly, but it does talk about the number of miners offline, defective, and the number of miners operating within test parameters --
Q. Let's look at -- I'm sorry.
A. Some of that is information about individual miners and some of that is information about collective miners.
Q. Let's look at TX169.
Dr. Cline, do you recognize that document?
A. Yes.
Q. This document is titled "The Operational Controls Overview," correct?
A. Yes.
Q. And this is for the Lancium brain, as you were calling it at that time, right?
A. Yes, I believe that was the term we were using at the time.
Q. And if we could look at the lower right-hand corner of this document.
The date there is May 7, 2019, correct?
A. That's correct.
Q. And let's look at TX057, page 5.
You see section B is titled "Automated

Control-Pricing Thresholds," correct?
A. Yes.
Q. And there it mentions the Lancium brain in the first sentence, correct?
A. Yes.
Q. It gives an example A, correct?
A. Yes.
Q. And in the last paragraph there it says: "If the LMP goes greater than $100, all miners will receive an automatic command to stop hashing."
Do you see that?
A. Yes, I do.
Q. And then the next sentence says: "This status will remain in place until LMP drops below $50," do you see that?
A. Yes.
Q. And then the third sentence says: "When LMP goes below $50, all miners will receive a command to start hashing and will return to settings prior to event."
Do you see that?
A. Yes.
Q. And, again, this document is dated May 7, 2019?
A. Yes.
Q. Are there any other examples given under section B, there aren't any, right?
A. No.

Q. Let's look at TX061. I believe Mr. Nelson used TX770 with you, but you recognize this as the e-mail Mr. McNamara forwarded to you that he received from Mr. Storms, correct?
A. That is correct.
Q. And that e-mail included the attachments, correct?
A. That is correct.
Q. And I believe you testified that you received the BearBox product details diagram that was attached to that e-mail, right?
A. Yes.
Q. And I believe you testified that you were aware of everything in that diagram as of May 9, 2019, correct?
A. That is correct.
MR. HORTON: If we can go to TX061, Page 11. If we can zoom in on the column headers there.
BY MR. HORTON:
Q. And, Dr. Cline, as of May 9, 2019, you understood what all those column headers meant, correct?
A. As of May 9, 2019, I did not review this spreadsheet.
Q. Understood. So -- but you do understand, at least now, what these column headers mean?
A. I reviewed this document once we were notified of the -- the lawsuit that had been filed against us.
Q. So it's your testimony, Dr. Cline, that you did not review this document at all prior to being on notice of the

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lawsuit?
A. Yes, that's correct.
Q. And I believe you said on your direct examination, Dr. Cline, that you remember specifically that you didn't discuss Mr. Storms' e-mail or his documents with anyone at Lancium.
Do you remember that?
A. At the time that I received it, yes.
Q. Is -- is that correct?
A. To my knowledge, yes.
MR. HORTON: Could we play the video at 52, 4 through 16.
(Video clip played.)
BY MR. HORTON:
Q. After you received Mr. Storms' e-mail and attachments as forwarded from Mr. McNamara, did you have any discussions with anyone about the contents of that e-mail or the attachments?
A. I may have discussed it with Michael, but I don't remember explicitly having conversations about that e-mail.
Q. You may have discussed it with him once or more than once?
A. I don't recall.
Q. So it may have been more than once. You just don't remember?

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A. I don't recall.
(Video clip concluded.)
BY MR. HORTON:
Q. You also don't recall, Dr. Cline, whether or not you downloaded the attachments from Mr. Storms' e-mail to your computer, right, when you received them May 9, 2019?
A. You were very emphatic about questioning me on that during my deposition. And because of your concern on that, I went back and I looked at my files, and I did download that spreadsheet, but the file creation date on my computer for that download is April of 2021, after we had been notified of the -- of the lawsuit.
I further had conversations with my lawyers about what might --
MR. NELSON: Don't -- don't reveal privileged conversations. I'm not sure what you're going to say.
THE WITNESS: But the file creation date of that file on my computer system is April 2021, after we had received notification of the lawsuit.
BY MR. HORTON:
Q. Was that your testimony during your deposition, Dr. Cline?
A. Pardon me?
Q. Was that your testimony during your deposition, Dr. Cline?

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A. My testimony during my deposition was I didn't recall opening the spreadsheet at the time that I received the e-mail.
Q. Are you confident that you made that metadata available to us during the discovery process, Dr. Cline?
A. That's something you'd have to discuss with my lawyers because they made the -- they made the copy of my computer and provided you with the metadata.
MR. HORTON: Let's look at TX061, please.
We can go to Page 2.
BY MR. HORTON:
Q. Dr. Cline, do you recognize this?
A. Yes, this is a press release.
Q. This is a press release issued by Lancium, correct?
A. Yes.
Q. And this press release was issued the day the '433 issued, correct?
A. I believe so.
Q. Okay.
MR. HORTON: If we could zoom in on that first paragraph there.
BY MR. HORTON:
Q. This says: "Lancium, a datacenter technology company has secured its fifth patent. This latest patent covers an essential function of Lancium's Smart Response power management software, which allows datacenters to ramp their power consumption up or down in as little as five seconds."

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Dr. Cline, you won't say what the essential function of Lancium's Smart Response software that's covered by the '433 patent is, will you?
A. The -- the patent is a legal document. I'm not a lawyer, it's not my job to interpret that legal document.
Q. Dr. Cline, you just told the Court that what Mr. Storms provided in his documents does not contribute to the claims in that patent, didn't you?
A. That's an opinion. That's my opinion.
Q. I'm asking for your opinion now, will you tell the Court what the essential function of the Smart Response software is that is covered by the '433 patent?
A. The ability to ramp up and down according to a -- an obligation to an agreement known as the Power Option Agreement, and to do that in a time period that's necessary in the case of CLR to -- well, in the -- depending on the type of Ancillary Service, you have to do that within a certain time period.
Q. Dr. Cline, you do remember being deposed in this case, correct?
A. Yes.
Q. And you swore an oath to tell the truth in that deposition?

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MR. LABBE: Correct, yes, Your Honor.
THE COURT: Yes. Because in the end we just want one actual set of all the exhibits. We only need one paper copy. And then just send us an electronic version as well.
MR. LABBE: Correct, we'll submit an electronic copy fairly soon mand then we'll also follow that up with a paper copy of all the admitted exhibits.
THE COURT: All right. Appreciate it.
MR. LABBE: Thank you, Your Honor.
THE COURT: All right. With that you may get started.
MR. NELSON: Defendants call Mr. Michael McNamara.
THE WITNESS: Good morning, Mark.
(Whereupon, Michael McNamara, having been sworn, testified as follows:)

DIRECT EXAMINATION

BY MR. NELSON:
Q. Good morning, Mr. McNamara. Can you state your full name?
A. Michael McNamara.
Q. Where do you live?
A. Newport Beach.
Q. What is your current position at Lancium?

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A. I'm the CEO and cofounder.
Q. Who else cofounded Lancium with you?
A. Ray Cline and Prashant Gupta.
Q. When was Lancium formed?
A. Formation date was November of 2017.
Q. What was your idea, why did you form Lancium?
A. We had the concept in the middle of 2017 that global energy was going to grow very, very fast. Wind and solar cost was going to keep dropping. Wind and solar joined the fleet very quickly, which led to the sort of necessary outcome of negative priced energy, and we thought there would be more and more of this.
We also knew there was a very quickly rising demand for energy from computing, and particularly for Bitcoin mining, and we thought there may be a perfect match. And we created Lancium to explore how that might work.
MR. NELSON: Can I get TX372, please. And can we turn to --
BY MR. NELSON:
Q. So this is an e-mail between you and Jesus ccing David Henson December 5, 2017.
MR. NELSON: Could I get Lancium 25166, please.
BY MR. NELSON:
Q. So you see there -- on the top there it's Ellen -- E Wolfe writes to you and Jesus. Who is E Wolfe?

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A. Ellen was a consultant in Sacramento who advised that the California system operator, she had deep knowledge of California system. And we were looking at California as an early opportunity for a lot of negative priced energy.
Q. And she writes to you and Jesus: "He and his partners are developing deployable dispatchable load products that both take advantage of negative prices and can meet demand response resources and curtail under negative pricing."
Do you see that?
A. I do see that.
Q. So can you explain that?
A. We discussed with our high level of our concept to monitor datacenters that would take advantage of the low priced energy. I do see she had a slight mistake. She meant we run at negative and curtail at high pricing.
Q. Yeah.
MR. NELSON: Can you turn to Page 25161.
BY MR. NELSON:
Q. So why did you send Jesus a nondisclosure agreement?
A. Part of our normal business practice, we send NDAs to any counterparty we want to do business with.
Q. Why did you include your introductory slide deck?
A. I just want to familiarize him with our business, and Jesus knew the generators better than Ellen did and thought

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he could make some introductions and so we explored business partnerships.
THE COURT: You have binders with exhibits that you're using?
MR. NELSON: I'm sorry, Your Honor, yes. I apologize, Your Honor.
Do you want me to continue, Your Honor?
THE COURT: Yes.
MR. NELSON: Or do you want me to wait?
THE COURT: You can continue.
BY MR. NELSON:
Q. So did you feel your business plans were confidential at that time?
A. Some of it was, certainly.
MR. NELSON: Can you go to Page 25159, please.
BY MR. NELSON:
Q. And what do you write to Jesus -- this is from you to Jesus. What do you write to Jesus here?
A. I say "any update on ways we can work together?"
Q. What do you mean by ways you can work together?
A. It's just a turn of phrase when I meet new counterparties.
MR. NELSON: Can I get TX778, please. And can you pull up the metadata here on this document, because it's not dated.

BY MR. NELSON:
Q. And so is this the -- the metadata on this, Mr. McNamara, indicates that it was modified the 31st of -- of -- the 31st of January, 2018. Is that consistent with the date that you remember this exhibit being put together?
A. Yes, that's right.
MR. NELSON: So can I get Lancium 20038.
BY MR. NELSON:
Q. And what -- what is this document.
A. This is one of our earliest investor decks.
Q. And did you have input into its creation?
A. Yes, I did.
Q. Can you look at --
MR. NELSON: Can we pull up 20042.
BY MR. NELSON:
Q. And you see the second bullet point, it says: "Lancium is creating a patent estate around rampable datacenters with wind power targeted as the ideal resource."
Do you see that?
A. I do see that.
Q. And what did you mean by that?
A. So at the time when we had the first concept of the company, 2017, we knew renewables were going to grow quickly. We knew datacenter demand was going to grow quickly. And we were exploring ways to put them together.

We thought a ramping datacenter was the perfect solution.
And I think as many entrepreneurs, you look to see what's in the market at the time. And at time, after extensive search, there was nothing. The concept didn't exist. So we got really excited and we say, we might be in the forefront of a new industry. We might be the leader in it. And if it is a new industry, like all the new industries, there's going to be a lot of innovations, a lot of intellectual property.
So looking at the forefront of this new potential exciting industry, let's be the leader and create a patent estate around a lot of our ideas.
Q. And we talked about at least one or two of those patents yesterday, so I wouldn't want to repeat that. But let me pull up TX767.
Is that your signature on the bottom?
A. Yes, it is.
MR. NELSON: And can we go to Page 1490.
BY MR. NELSON:
Q. And is this one of the patents that -- patent applications that are part of the -- your plan to create a patent estate?
A. Yes, it is.
Q. And you're the Mr. McNamara as inventor?
A. Yes, I am.

Q. And can you read the title of the patent, of the application?
A. Providing computational resource and availability based on power-generation signals.
MR. NELSON: Can I get TX164. And let's go to Page 23 -- 2235.
BY MR. NELSON:
Q. And are you the Mr. McNamara that's listed as the inventor?
A. Yes.
Q. And can you read the title of this patent -- this application?
A. Systems and methods for axillary power management of behind-the-meter power loads.
MR. NELSON: And can we go to TX165. And let's go to Page 3137.
BY MR. NELSON:
Q. And are you the Mr. McNamara that's listed as one of the inventors on this application?
A. Yes, I am.
Q. And what is the title?
A. Redundant flexible datacenter workload scheduling.
MR. NELSON: And can we go to TX166.
BY MR. NELSON:
Q. Is that your signature?

A. Yes, it is.
MR. NELSON: And can we go to Page 3420.
BY MR. NELSON:
Q. Are you the Mr. McNamara listed as inventor?
A. Yes, I am.
Q. And can you read the title?
A. Behind-the-meter charging stations with availability notification.
MR. NELSON: Let's go back into our timeline again, to Exhibit TX776 -- I'm sorry, let's go to TX266. I may have it wrong. Let's -- okay. I'll leave this one. Can you -- can we go to Page 20049. So this is of exhibit TX266.
BY MR. NELSON:
Q. Can you explain the graph of the right side?
A. So this is where we're beginning to conceive of the opportunity, it's January 2018. We took the Real-Time hour intervals, ERCOT West, where it's the most prolific wind and put them in distribution.
And I think what's noticeable is that's not a normal housing distribution on the right. It has two very noticeable and important distinctions. On the left you see a big clump around the zero, and you see a very long right tail. Both of those are exciting opportunity for rampable datacenters.

And as we did more work, we got increasingly excited about the opportunities there.
Q. And so looking at the blip on the left there where it peaks up, where it says 0.00 and it peaks up around 200, what -- can you explain what that signifies?
A. So you see a distribution, and that distribution was growing at prices right around zero and below zero. And the one on the right, you can see a very long tail of prices that go up to at this time $9,000 a megawatt hour.
Q. And so what does it mean in the -- the portion on the left, minus ten to zero. What does that mean in terms of opportunity?
A. It means the power is less than free. You'd be paid to take electricity.
Q. And what does it mean sort of further to the right, 40, 50, 60 where the right tail goes along?
A. You see that keep going. If you went all the way out to 9,000, they were a small number but meaningful number of very high-priced hours, which has a very meaningful impact on the average price versus the medium, which is -- which is part of the opportunity.
Q. Did you understand at this time sort of what a power purchase agreement was?
A. Yes, we did.
Q. And what did you understand that was?

A. An arrangement between a buyer and a seller of a load and a generator provider to purchase power in some structure, fixed, floating, shaped, but we understood the concept.
Q. And what -- what was the significance -- strike that.
So if you're looking at the -- if you're looking at the graph again, sort of on the left side, what was the significance of that in terms of if you're a renewable generator, how would that affect you?
A. If the renewable generator -- generators need to generally hedge in order to get financed. Those hedges are suboptimal. There's a lot of what they call basis risk, which is the financial impact versus physical delivery of the power.
If that left tail kept growing, new renewables couldn't be built. Part of the inspiration of the company is we could resolve that left tail and speed more renewable. And within win a very low cost of energy, the renewables would get an over taker that could physically settle the power, we would win together.
MR. NELSON: Can we go to Page 20054.
BY MR. NELSON:
Q. Can you explain this figure?
A. We had a graphic artist sort of put what we had in our mind into a graphical format. What we see is modular

datacenters, and different types facilitated by wind and solar project sitting behind the meter. And that's what you see in the -- in sort of the top of the page.
Q. And so the module datacenters, are those the -- are those the gray sort of container-looking things?
A. Those are the gray --
THE REPORTER: I'm sorry, you have to wait for him to finish his question.
BY MR. NELSON:
Q. Are those the gray containers there and the gold container?
A. Yes, that's right.
Q. And then the wind farm is -- the wind or solar is the thing with the windmills and the solar?
A. Yes.
Q. So let's go to TX594. So David Henson is writing to you, and then you also get you writing to a gentleman named Brian at NextEra Energy?
A. I do.
Q. Who is NextEra?
A. NextEra is the largest power company in America.
Q. Why were you writing to them?
A. They had a large fleet of wind and -- and future solar in Texas, and we thought their assets could be very well-suited to our solution.

Q. And so let's -- so we're kind of -- this is February 6, 2018. What's the -- well, let's go to page -- the portion here: "Our power management platform takes a variety of signals, including grid telemetry, nodal economic Real-Time data to derive a shaped load response in the minute response time frame."
Do you see that?
A. I do.
Q. And what are you intending to convey?
A. So we were exploring a business relationship where we would buy the power from NextEra at a key located site. And this is David Henson, who is then our CTO, explaining how our control system works in a remote fashion.
We would read grid telemetry signals, we would read the Real-Time power price at the generator, and then we would create a load response based on those inputs, a shaped load response.
Q. What do you mean by a shaped load response?
A. We knew at the time that we could vary the power of the datacenter of the servers, and we knew we'd want them varied in different ways based on different inputs, and that creates a shape. So it could be full power, it could be minimum power, it could be some in between power.
Q. And what -- what do you mean by economic Real-Time data?

A. We knew those high-priced hours were very valuable from the wind generator, we knew that from the start of the company. And the concept -- the earliest commercial concept was we would give those hours back by observing Real-Time price and sending a command to the datacenter to spin down.
Q. Let's go to TX711 and 712. Why does Lancium seem to become a market participate with ERCOT?
A. There's a number of reasons to be a market participant. I think the motivation here at this time was really to get more data faster from ERCOT. And in order to do that, we had to join as a member.
Q. And this is May of 2018; is that right?
A. Yes, that's right.
Q. So turn to the last Page 234985. Is that your signature?
A. Yes, it is.
Q. And what kind of information were you trying to get from ERCOT at this time?
A. Information on Real-Time power prices, load zone prices, hub prices, reserves, basically all the information that could inform our decision-making.
Q. And how were you seeking to get that information?
A. Directly from the ERCOT data sources.
Q. Electricity or other means?
A. It would be electronically, yes.

Q. So turn to the first page, 34972? So you ultimately became an independent market information system registered at this point with ERCOT?
A. Yes, we did.
Q. And what did that permit Lancium to do?
A. It allowed us to join state quota processes and get that information faster and more robust.
Q. Let's change subjects a little bit here. Did Lancium ever communicate with GlidePath?
A. Yes, we did.
Q. Why would you communicate with GlidePath?
A. We met GlidePath executives in summer of 2018 at a conference. I presented at the conference, explained our solution. They approached us thereafter and said, "Your solution sounds like a perfect fit for some of the wind products we own -- let's find a way to work together."
Q. And let's go to TX795. And who is Chris Vickery in this e-mail?
A. He was an executive in the commercial operations at -- at GlidePath.
Q. Who is Chris McKissack?
A. I believe he was the COO at the time. I think he's the CEO now.
Q. And so if you look at the bottom, Mr. McKissack writes to Jon. And is this -- who is this Jon --

A. He was our then CFO.
Q. And he saying: "Jon, attached is a fully executed NDA."
Did you sign an NDA with GlidePath?
A. Yes, we did.
Q. And then if you look above, it says: "If you send us the production history of the Sommerset project, we can begin a financial analysis straight away."
Was that ever done?
A. Yes, it was.
Q. What was the purpose of obtaining -- what was the purpose?
A. Throughout 2018 and 2019 we worked with many major power producers on wind projects. The standard we would enter into a fixed-price PPA at a premium to their historical pricing.
And we would also agree to curtail our datacenter based on Real-Time signals so that the wind operator could capture those high-priced hours. And then we'd perform an analysis to show much uplift, how much more value for your power would you receive wind power we would receive if we --
Q. And what -- why are -- why are you requesting the production history at this point?
A. Because it allows us to know the production of power

at that location at an interval and the Real-Time power price, which informs that analysis.
Q. So let's go to TX482 and 483. And what is referred to -- what's the LMP node that's referred to there?
A. That's the Locational Marginal Price for that location; so in other words, the power that generator will receive.
Q. And can you tell me what's discussed in this e-mail and supposedly attachment?
A. It's Jon requesting hourly production data from 2015 of that Sommerset project.
Q. Is this the -- is this the actual production data that's being sent?
A. Yes, it should have been.
Q. All right. So let's go to TX478. And can I get the -- yeah, can I -- so Jon writes: "Thanks a lot, Chris. We ran the production data and, as suspected, the site does not work well for our solution."
So why did the Sommerset not work well for Lancium's solution?
A. So at the time GlidePath owned this asset in Sommerset and they were evaluating buying Texas assets. The Sommerset asset was in a different grid called PJM. It has less wind and is just a fundamentally higher priced location, so our solution was not as compelling for this

location.

Q. So let's go to next e-mail. This is part of the same chain. And you write: "We would love to find a way to work together."

Why are you telling GlidePath you would like to find a way to work together?

A. It's just my common -- my common turn of phrase I use and I think we still wanted to explore ways to work with GlidePath.

Q. So let's go to TX233 and 234. And now we're moving again further -- further forward in time with GlidePath. So is this you continuing to explore the GlidePath relationship?

A. Yes, that's right.

Q. So let's go -- can you just basically tell me sort of what you're doing here with GlidePath in one or two sentences?

A. So we performed a normal analysis -- the normal analysis we performed on many wind farms was enter into a fixed price at a premium to the historical pricing we received. And also give those generators the high-priced hours back at certain thresholds and see how much more value we could create for the wind operator.

Q. And let's go to Page 18300 of Exhibit 234. And it says: "LMP node assumed to be the SPS hand Ford done Exelon

for wind RAX 140."

Do you see that?

A. I do.

Q. What is -- can you tell from that what wind farm what was being analyzed?

A. At that time GlidePath was evaluating buying some wind projects from Exelon utility, and this was them.

Q. What is Exelon 4?

A. The individual asset, and that's the LMP of that asset.

Q. Did you analysis the Exelon 4 data?

A. We did.

Q. And what was the results?

A. While the project was small, it was very disadvantaged. It had a lot of negative-priced energy. And so our solution could provide a meaningful uplift to the realized price for the project.

Q. So what did you do next on the project with GlidePath?

A. We sent them a term sheet.

Q. Did you have additional communications with GlidePath after the term sheet and the exhibit that's here?

A. We had numerous phone calls, physical meetings, conference calls, lots -- lots of correspondence.

Q. And let me pull up TX485. And is this kind of a

continuation of that correspondence?

A. Yes, that's right.

MR. NELSON: Can I pull up TX224.

BY MR. NELSON:

Q. Now we're March 2019. Is this another continuation of that project?

A. Yes.

MR. NELSON: Can I pull up TX300.

BY MR. NELSON:

Q. Is this another continuation of that line of conversation?

A. I think it was us reviewing the electrical one line.

Q. And let's pull up TX300, again moving now into April. Is this another one of those communications?

A. Yes, it is.

Q. Let's pull up TX261. Is this another of those same lines of communications?

A. Yes, it is.

Q. Let's pull up TX262 and 263. Continuing on, is this another string -- another exhibit in these strings of communications?

A. Yes, it is.

Q. Maybe it's not. Oh, this is -- so hang on here. This is -- what is this one? What is McAdoo? Sorry about that.

A. McAdoo is another project we were evaluating in Texas and we were applying some of the engineering design work from the McAdoo project to the GlidePath project.

Q. Okay. So can you explain that a little further?

A. We -- through 2018 and 2019 we evaluated numerous wind opportunities. One of the most advanced is McAdoo, which is a wind project in Central Texas. That engineering work was more advanced, and we tried to take our lessons learn from the McAdoo engineering to provide the cost estimates to the GlidePath project.

Q. Let's pull up TX255. Is this another communication in the line of communications with GlidePath?

A. Yes, it is.

Q. And then finally -- and then finally, let's pull up TX209 through TX213 and just flip. And just flip -- if I could ask the operator the flip those real quick.

And my question is: Are these further communications with glide?

A. Yes, they are.

Q. And what is the -- what is the schematic stuff that's being shown here on some of the exhibits?

A. Some of our electrical design paths between us and our subcontractors.

Q. Okay. So let 's go back to sort of the main timeline here to late September 2018. Can I get TX176 through TX180.

So you see on the left side it says "deal status"?
A. Yes.
Q. Can you just sort of summarize sort of what this is intending to represent?
A. So SBI Holdings, formerly part of a Japanese corporation, a letter series A, and as such, we would give them regular updates.
Deal status was our most advanced commercial arrangements with various large power companies and various projects, and we were just viewing the various status, which range from negotiating the final tariff with the utilities to being in term sheets to exploring financial arrangements.
Q. And what was the purpose of the SBI -- the call that this is discussing?
A. Just to give them a general commercial update on our commercial progress and financial status.
Q. Let's go down a little further on the slide to "build an operational update." You see box build there?
A. Yes, I do.
Q. And what -- can you summarize sort of the history of Lancium's box building efforts?
A. So when we started the company, we knew we were building something new, you know, the concept of a ramping datacenter. We also knew it had to be lower cost than

traditional datacenters because traditional datacenters are built for redundancy and limited footprints and all sorts of constraints that we did not think applied to us.
So buying off the shelf at the time wasn't possible. There wasn't a big universe of sellers of these types of datacenters, so we began evaluating, building our own or finding partners.
Our first partner was TAS, which Ray talked about yesterday. It became apparent that that box was just going to become too expensive. It got over-engineered quickly. After that we sent a team to China. They looked at the boxes there, very expensive but very dangerous, and they would never pass inspection.
And then we found a group in Canada that had experience building for another Bitcoin miner called JV Driver. They had a lower price point, and they seemed competent, so we were working with them, basically taking their existing designs and changing to our specification, and I think at this time we were on a megawatt and a half box cost -- of box size.
Q. And did that -- did that box size ever increase?
A. It went up to 2 megawatts, and I think at one point -- you'll see there if we're looking at as much density as 5 megawatts per container.
Q. So let's go to TX636 and TX637.

What is the e-mail?
A. It's a note from me to Kenan Ogelman, who's the head of commercial operations at ERCOT, Mark Ruwain, who was then the head of Sullivans, he's retired since; cc with Jon Cohen, our CFO, and then Ken Anderson is on the e-mail, he's a former utility commissioner of Texas, who's an advisor.
Q. And why were you sending a PowerPoint regarding Lancium to ERCOT?
A. From the earliest days of the company and still through today, we work very closely with ERCOT. I think the point of this was an early meting with more senior executives. We wanted to familiarize them with our business model, the really beneficial impact we thought it would have on the grid.
And then we wanted to talk about some details of net metering and discuss one of our individual projects.
Q. And at this point, what's the business model that you're talking about?
A. The colocated datacenter with wind.
Q. Was that behind the meter?
A. Yes.
Q. What was ERCOT's reaction?
A. Very favorable. They thought it was very innovative, and we had a very productive meeting.
Q. Did you have other -- did you have other

communications with ERCOT?
A. Continuously.
Q. Let's go back -- let's go back real quick to -- let's go to TX637 at 34325. I think I asked you about this a little bit, but we've got a figure here that I wanted you to describe in a little bit more detail.
A. We spent a lot of time on R&D. We also spent a lot of time in '18 and '19 on commercial arrangements. It is not trivial to install these datacenter facilities.
The most disadvantaged wind where there's the least amount of load that runs from wind, but the most prolific winds are in municipal co-op territories, which have certain complexities for net metering.
And ERCOT was accustomed to net metering for companies that owned their own generation at their own sites. They were less accustom to third parties colocating with wind.
So this was a proposed structure. We spent with -- a lot of time with our advisors and legal about a way we could leave the wind power at a favorable price for us and the wind through distribution co-ops while also getting constant always on power for our auxiliary load.
Q. Did you have other communications with ERCOT?
A. Yes, continuously.
Q. And let's go to TX476, 477. Is this another further

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communication with ERCOT?
A. Yes, it is.
Q. And let's go to TX629. And is this another example of the further communications with ERCOT?
A. Yes, it is.
Q. And let's go to TX627. Is this another communication with ERCOT?
A. It's to Don Tucker, the head of metering, yes, sir. I remember.
Q. And so can -- what is the current status of behind the meter loads within ERCOT?
A. Us and others were very eager to advance net metering. In 2021 they passed a little protocol rule change called 945. It clarified a lot of the issue you saw on that screen right there, and it's actually helped pave the way to make it easier and more straight forward --
(Reporter clarification.)
THE WITNESS: It actually helped pave the way to allow more colocated datacenters to interconnect with wind and solar projects faster ERCOT.
BY MR. NELSON:
Q. Okay. So let's go back to sort of our main timeline here. Let's go to TX748. And let's start at the bottom. Well, let's start -- let's go at the bottom starting with the e-mail beginning on May 1st.

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Way down at the bottom -- there's a suggestion way at the very bottom Jon Cohen writes, "would you both be able to meet tomorrow at 12:45?"
Do you see that?
A. I do see that.
Q. So who -- who are the people he's talking about here?
A. So there is API e-mail claim with Jon Cohen, then CFO, and Jamie cavity with a small Bitcoin line operator called Cormen, and then his business partner Justin Nolan.
Q. And why did -- did the meeting that is talked about here -- did that happen?
A. Yeah, we had lunch.
Q. When did you have lunch?
A. That was on May 2nd in New York City.
Q. And what was the subject matter of that launch?
A. Jon knew them from a mutual contact. They wanted to talk to us because they viewed us as having an expertise in Bitcoin mining and energy.
And they were evaluating the acquisition of something called Hodl Ranch, which is transmission substation in West Texas. The substation was built, but it was a piece of dirt that was custom made for a large Bitcoin mining operation.
Q. And what did you learn from that lunch?
A. It was very informative what Jamie and Justin

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disclosed the information they had from HODL, and HODL was -- in their financial information was quoting a power price that was shockingly low to us.
So we were very, very curious on a grid connection datacenter could achieve this very low price, and one of the things that Jamie and Justin disclosed was that HODL was going to enroll in the ERS program which resulted in a material decrease in their power price, and we were very curious.
We had spent all this time and research, really trying to find this fabulous price with wind, and here was this connected site that got an excellent power price, so we wanted to learn more.
Q. Can you look at the entry on May 3rd. It says "great lunch yesterday." So is that the lunch you're referring to?
A. Yes.
Q. And what do you mean by "I think there are a number of ways we can work together, Jamie, we'll see you soon"?
A. It's my term of phrase, if I meet someone that I expect to work with in the future.
Q. And this is 9:16 in the morning, correct?
A. That's right.
Q. And this is the day of the FCAT mining conference; is that right?
A. It was the Friday, yes, in the morning.

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Q. So the morning of the conference?
A. Yes.
Q. So how was -- how was the folks at HODL -- talking about HODL Ranch, how were they getting such a good grid power price?
A. They were enrolling demand response programs, and they were buying a West Texas strip at a low price, and they were avoiding team lead counts by being transmission connected.
Q. Were any programs discussed?
A. We discussed the ERS program at the lunch.
Q. And had you heard of the ERS program before?
A. We had been solely focused on behind the meter opportunity set for which the demand response programs didn't apply.
Q. And so you -- let's pull the slide back up. And you said "Jamie, we'll see you soon." What do you mean?
A. Jamie was also going to that same conference.
Q. Did you speak to Mr. McAvity at that conference?
A. Yes, we did.
Q. Did you learn anything else from that discussion?
A. Um, we talked, I think, again about the HODL Ranch opportunity and Bitcoin mining in general.
Q. Did you speak with anyone else at that conference relating to HODL Ranch?

A. I believe I met Gideon Powell, who was the provider of the whole ranch project.
Q. Did you go to dinner later that day with anyone?
A. Yes, it was a group dinner of about eight people. Myself and Jon, our CFO. Jamie McNamara attended with I believe Rich Goodwin, who was his business partner, Ben Lawler, another Bitcoin manager in upstate New York. Steve Barber and his wife attended the flare gas mining, and then Mr. Storms.
Q. All right. Do you know -- so who do you know attended that meeting for sure?
A. Myself, Jon, Jamie, Mr. Storms, Steve Barber and his wife and I believe Rich Goodwin as well, and Bin Lawler was there.
Q. Are you sure Steve Barber and his wife were there?
A. I remember them there, yes.
Q. So can you describe the general atmosphere of that meeting?
A. It was a rectangular table. People had just met each other. I think we were excited about the conference. It was a free flowing business dinner.
Q. What did you know about these people at the time of the dinner?
A. Well, Jamie I just met. Steve I knew from Twitter. I followed him on Twitter, and then Jon is obviously my

business partner, and everyone else, it was the first time they had met each other.
Q. And that includes Mr. Storms?
A. Yes, that's right.
Q. Were there discussions during that dinner not just, you know, generally?
A. Everyone talked about the business in general. Everyone talked about their business modelling. Like I said, it was a pretty normal business dinner.
Q. People talking in normal tones of voice?
A. Normal tones of voice, group discussions, individual discussions, about an hour and a half dinner.
Q. Do you remember where you were sitting in connection with Mr. Storms?
A. It was a rectangular table. Mr. Storms was either across or catty-corner from me.
Q. Were people drinking during the dinner?
A. Yes, they were.
Q. Did you talk with Mr. Storms during the dinner?
A. Off and on. I talked with everyone.
Q. Did you talk with Mr. Storms in a normal tone of voice?
A. Yes, I did.
Q. When speaking Mr. Storms, were you huddled up in sort of a private conversation?

A. No.
Q. Did you pay for a portion of the dinner?
A. We split it, I paid for half.
Q. Can I get TX871.
Is that a receipt from your portion of the dinner?
A. Yes, that's right.
Q. Do you recall anything remarkable about the dinner?
A. One of the downs of this business, I end up traveling a lot over, 80 nights a year, and almost every night is a business dinner. It seemed to me at the time a pretty normal business dinner where you meet with people in the industry and talk about the industry.
But the one exception, this is the only dinner I have been sued for.
Q. Did you -- did you do anything to sort of verify how many nights you were on the road during 2019 and how many such dinners you likely had?
A. I asked our administrative assistant.
Q. And what was the result?
A. About 80 nights a year.
Q. Let's go to TX742. I know -- did you -- well, did you communicate with Mr. Storms after the dinner?
A. We exchanged contact details.
Q. Did you and Mr. Storms ever discuss ERS, demand response programs or ancillary service?

A. No, we did not.
Q. Why did you communicate with Mr. Storms after the dinner?
A. Um, as I mentioned, we were looking at our box cost. You know, one of the tensions in the business was finance always wants to drive the cost as low as possible. Engineering wants to design to the highest spec as possible, and there wasn't a big universe of price points for these boxes.
So Storms discussed his box. I was curious on what the price would be.
Q. Were you looking for project -- or product managers at the time?
A. We were expanding our traditional computing business, and I discussed that I'd love to have a PM for that role, and he said, "I think I might have somebody."
Q. So looking up the chain here a little bit, you say -- he says to you, "I'll put some feelers out of my PM friends this week about what we talked about."
What is PM there?
A. Product manager.
Q. You say "that's great. I also think your boxes may have some benefits versus the ones we are doing with JV Driver."

Do you see that?
A. Yes.
Q. And is there a typo in that text?
A. It should say JV driver.
Q. JV as in victory?
A. Yup.
Q. You says "lots of stuff to collaborate on." What do you mean by that?
A. Just my normal term of phrase.
Q. What did you think of Mr. Storms?
A. I thought he seemed like a competent fabricator of the box, and I was curious what the price was.
Q. Anything else?
A. That's about it.
Q. So going back down a little bit further in the text chain, so you ask him "Storms, can you send me those box design specs, please?"
Do you see that?
A. I do.
Q. Was there any urgency at this time that you are texting him?
A. I don't remember exactly why. We were probably going through budget again, and I probably said "I'd like to have a data point for what another box cost would be."
Q. So let's go to TX170 to TX175. Is this an e-mail you

received from Mr. Storms?
A. Yes, it is.
Q. Let's go back to the dinner for just a minute. So did you ever receive any documents from Mr. Storms during the dinner?
A. No.
Q. You've never seen the source code for anything Mr. Storms has done?
A. I don't even review our own source code. But the answer is no.
Q. So he -- let's talk about this e-mail. So what did you do when you received it?
A. I got it. I clicked through the attachments. I saw what I was looking for with the price, which was way too high, and I forwarded it to the team as just an FYI for a data point, and I never thought about it again until we got sued.
Q. Do you know which -- which attachments you opened first?
A. I probably opened them all. I don't remember the exact order, but my guess is I opened in the order they appeared in the e-mail.
Q. So let's pull up the last exhibit here, the last attachment, the spreadsheet. It should be TX175. Did you have any reaction when you opened the spreadsheet?

A. What it looked like was a data sent -- dataset of power prices in an interval which we've looked at many dozens of times. I saw some other column headings. I did notice it was hard coded, which makes it inscrutable, and I closed it shortly thereafter and forwarded the e-mail.
Q. Are you aware that Mr. Storms says there was something new and different in this spreadsheet, a power sell-back?
A. I am aware they are asserting that.
Q. Have you looked at it since the litigation -- or have you looked at it again since this litigation?
A. We have.
Q. Do you have any understanding how there could be both Day-Ahead revenue and Real-Time revenue?
A. To be honest, counselor, I find the whole document inscrutable. And one of the things is you don't know who's making the decision, is it one entity, is it multiple entities? And like I said, when things are hard coded, you don't know what the logic is.
Q. Did you know about power sell-back at this time?
A. No, we were focused on commercial arrangements where we would curtail and the generator retained the high priced hours, not ourselves.
Q. Did you learn about power sell-back from Mr. Storms?
A. Absolutely not.

Q. So let's go to TX770. And so is this the e-mail you were talking about where you forwarded it on to others at Lancium?
A. Yes, that's right.
Q. You say "he seemed very competent." What did you mean?
A. I thought he was a competent middle fabricator of boxes.
Q. So how long do you think you spent looking at Mr. Storms' e-mail including all the attachments?
A. No more than three minutes.
Q. And how do you come to that conclusion?
A. That's how quickly I sent the e-mail.
Q. And so could I get the two -- Exhibit 170 and 770. So the first one is Austin Storms sends it to you at 11:32:01; is that right?
A. Mm-hmm, yes.
Q. And it looks like you forwarded it on at 11:35:32; is that right?
A. Yes.
Q. And is it your understanding that that's the amount of time you spent looking at this?
A. Yes, that's right.
Q. Did you ever look at it again other than in the course of this litigation?

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A. Never looked at it, never thought about it again.
Q. What happened next with respect to Mr. Storms?
A. We got a lawsuit in 2021.
Q. Why didn't you follow up with him further on either the box design or the -- the PM request?
A. The box was so expensive, it wasn't -- it was never going to work. And I don't remember on the PM. We probably found someone else or decided not to fill the role.
Q. Do you know why Mr. Storms sent his -- the drawing and the spreadsheet that also came with this e-mail?
A. Sorry, say again.
Q. Do you know why he sent the -- the specification -- the picture drawing and the spreadsheet that we just put up in connection with this e-mail?
A. I don't know.
Q. Did you ask him for that stuff?
A. No.
Q. Do you understand that he was treating this information as confidential?
A. I understand that now.
Q. Did you understand that then?
A. I don't think we had any discussion of anything confidential.
Q. Did you treat it confidential, the e-mail and the attachments?

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A. I sent it internal and never thought about it again or sent it anywhere else.
Q. So let's go to TX748, 749, and 750. So now we're jumping back in time a little bit to -- for three more days here, so prior to you getting an e-mail. So what is -- what are you doing with Jamie McAvity here on the 6th?
A. So we had the lunch with Jamie the week before. We were very curious on HODL Ranch. We also thought there may be a way to collaborate on wind projects, so we wanted to keep exploring so we -- we sent an NDA.
Q. So let's go to TX743 and 744. Now this is one day later. So what -- what do you mean here at Page 744: "We think the ERS market will shrink"?
A. So we had just learned of the ERS market from Jamie. It was surprising to us and this is trying to get our heads around it. And also trying to compare HODL Ranch to one of our wind projects.

One of the downsides to the wind arrangement we had is he would not have 100 percent up time, and sometimes he might not even have 75 percent up time. Where HODL Ranch would have 100 percent up time.

So we were trying to understand the arrest. We Googled it. It looks like a fixed product, a fixed dollars -- quantum of dollars, which would mean it's more entities participated it should go down, so that was our

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guess at the time.
Q. And you say: "We did our best to compare -- to compare the assets apples to apples," what do you mean?
A. Power price, size, cost.

MR. NELSON: So let's go to TX646. And if you turn to the bottom of Page 3380.

BY MR. NELSON:
Q. So this is Jon Cohen writing to Todd Wilson of Calpine asking him: "Do you have any intro materials on participating ERCOT's ERS program? We think our load is well-suited but were curious as to what the process and requirements are."

So why did Jon send this e-mail to Todd Wilson of Calpine?
A. So we learned about the ERS program from Jamie at that lunch. We're trying to understand it. It's a material benefit that wasn't on our radar before. So Jon, our CFO, you know, we want to talk to naturally talked to Calpine, our electric provider, and want to see if they can inform us and tell us how it works, how do we roll, what it's worth.
Q. So let's go to the top of the e-mail. So what was the -- what was the results here of the inquiry with Calpine?
A. Calpine's primary business is power generation and gas generation. So they don't offer demand response to

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customers, so Todd passed on our information to Jay, who was a consultant who would broker demand response at ERCOT.
Q. So let's go to TX437 and 438. What is being discussed in this e-mail?
A. So there's a conference call, I don't think I joined, where Jay Young outlined a demand response program at ERCOT. And then following up on a Saturday, he sends the slide deck to the group.
Q. And before seeing the -- sort of the information, had you heard of demand response?
A. Only in the context of ERS with Jamie McAvity.
Q. So let's go to 26309 and 2 -- well, let's go to 26309. Is this -- what is on this slide?
A. This is another demand response program that we were just learning called Load Resource.
Q. And let's go to next page. This is another -- another slide about the same thing?
A. That's right.
Q. So what did you decide after receiving this e-mail from Jay Young?
A. I think we were, you know, very intrigued. The LR program was more complex, but we were good with the complexity and ramping. And it looked more lucrative. So we started working very hard on understanding how it worked.
Q. Let's go to TX740 and 741. So now this is an e-mail

from you to Jay Young; is that right?
A. Yes, it is.
Q. It's a few days later. Why did you send this information to Jay Young?
A. So what we're trying to do is understand the economic impact of these demand response programs. We had a highly advanced project at McAdoo, and we were curious as the way we could get our McAdoo wind projects in to these same LR programs so we could get the benefit of both. And so I sent him our slide deck so he could understand our business.
Q. So let's go to TX496 and 497. And so what -- what happened next? What did the discussions between you and Mr. Young ultimately lead to?
A. He referred us to a number of QSEs, which we had -- I think we had the best relationship or best feeling about MP2, which is a shell company. And then we worked very closely with MP2 to get enrolled our Thomas Road research facility to both ERS and LR.
Q. And why couldn't Calpine be your QSE?
A. Because, as I mentioned, because of their -- a business decision, they were not going to offer demand response to the customer.
Q. And what is the -- the document on the right, TX497?
A. It's us working with MP2 to be in demand response and our commercial arrangement with MP2.

MR. NELSON: And can I get -- can I get you -- can I get Page 30580.
BY MR. NELSON:
Q. Is this your signature?
A. Yes, it is.
Q. And if you look at the top, it says opportunity LR. What's LR?
A. That's the load -- Load Resource.
Q. And it says starting 9/1/2019, do you see that?
A. Yes.
Q. But this is -- the agreement is dated July 2019?
A. Yes.
Q. So why is the start date so much further on?
A. Again, LR is not a trivial to -- to enter into. It requires an upgraded meter, it requires telemetry installed, it requires an under frequency relay, shunt trip that gets installed at the facility. And then I believe the database for the QSE and ERCOT themselves has to be updated.
Q. So let's kind of change gears a little bit here. So let's go to 758.
So we talked about Calpine a little bit. So what is Exhibit 758?
A. So Jon Cohen left in the summer of 2019. Jon was the primary counterparty to Todd Wilson and he was responsible for, you know, power procurement and strategy. When he

left, I put myself as the primary contact. And then Todd sends a note and said: "Hey, Jon was looking to fix your power price at Thomas Road, do you want to continue that discussion? Jon was focused on fixing it because that price was dropping to two-year lows. And it's like a mortgage rate, when the rate is low, you want to lock it in."
Q. And so what was -- what was the agreement with Calpine before -- what -- what was the then-current agreement with?
A. So at the time we were on -- when we enrolled our first power agreement, it was on index. So we paid spot price for whatever power we consumed.
Q. And so Jon wants to look into the fixed pricing. Did you look into it?
A. We did. I was curious. So what I told Todd was what we're doing at our Thomas Road facility, because we're on index and we understand breakevens, we would send our data down at the research facility at a breakeven low $100.
And I said: "Todd, could we do an apples to apples comparison, and if we get that same curtailment under fixed price, what would our effective cost of energy be?"
Q. And let's go to TX763 and 764. And is this the result of that look back?
A. So Todd sent that the very next day in a simple spreadsheet. And the impact was we could reduce our

delivered power price by $10 a megawatt hour, which was extremely meaningful.
Q. And why was that meaningful?
A. It's a material reduction of power cost.
Q. So let's go to 764. And -- well, first of all, do you know what a WACOE --
A. I guess it's a Calpine term. I haven't seen it anywhere else, but it's weighted average cost of energy.
(Reporter clarification.)
THE WITNESS: Average cost of energy.
BY MR. NELSON:
Q. And so let's go back to the spreadsheet real quick. So you see it says sell-back megawatt per hour and sell-back value, do you see that?
A. Yes.
Q. In rows nine and ten.
So what is -- what is that referring to?
A. So what's happening here is the fixed price he quoted us was $33 a megawatt hour -- hours. He looked at our June and July consumption, which was 3,000 megawatt hours. And then our invoice was about 100 grand. If we sold just 86 megawatts hours back, which is not many compared to the total power, it would reduce our total energy cost by a third. So it would take the 96,000 price down by 33,000 to 63,000. Which is -- like I said, is material.

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Q. So did you ever -- did Lancium ever enter into a fixed-price agreement with Calpine?
A. Very shortly thereafter.
Q. So let's go to TX756 and 757. And is 757 a copy of that agreement?
A. Yes, it's the addendum for fixed-price, fixed-volume electricity, that's right.
Q. And let's pull up paragraph 4.2.2. And can you take a look at paragraph 4.2.2 and tell me what that is?
A. That allows the settlement in the interval for us to capture the delta between the Real-Time price and the fixed price for the quantity of power we've purchased.
Q. The sell-back provision, basically?
A. Sell-back.
Q. Is this something you negotiated with Calpine?
A. Nope. The language, no, it was standard contract terms.
Q. So let's go to TX122. And is this your earlier addendum to Calpine?
A. That was our -- yes, that's right.
MR. NELSON: And can you -- can I get section 4.3.2 pulled up.
BY MR. NELSON:
Q. And can you tell me what your understanding of this provision is now?

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A. It's the same term.
Q. So the earlier agreement contains sell-back as well; is that fair?
A. Yes, that's right.
Q. And was that negotiated at any point?
A. No, it was standard Calpine language.
Q. So why -- why -- since it was in the earlier one, why weren't you selling back power earlier?
A. Because we didn't prepurchase a quantity of power, we were -- we were just taking power at the spot price.
Q. So is this -- what's described in Exhibit 756 and 757, is that how Lancium learned of sell-back?
A. Yes, it is.
Q. Did you learn about it from Mr. Storms?
A. No.
Q. So let's go to 567 and 568. And so this is an e-mail from you to Mr. Cline, is that right?
A. Yes, it is.
Q. And so you say: "This is cool. We now have two sources -- revenue sources: Bitcoin mining and selling power back to the grid."
Is that right?
A. Yes, that's right.
Q. And what are you expressing to Mr. Cline here?
A. I'm expressing that this is a new opportunity and we

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should keep exploring like we do all new opportunities.
Q. And did moving to the fixed-price Calpine agreement have anything to do with this?
A. Yes, the fixed-price Calpine contract enabled selling power back to the grid at a premium.
Q. And can we go to TX -- well, hold on.
Let me see.
(Pause.)
BY MR. NELSON:
Q. So does the power sell-back, does that relate to the demand response programs at all?
A. No, they are totally separate.
MR. NELSON: So let's go to TX471. And if I could get Page 30066.
BY MR. NELSON:
Q. So you see on the right there, there's -- it says new and there's a red box?
A. Yes, it is.
Q. So the first one is demand response, so where did you learn about that?
A. We learned that from Jamie McAvity and then the exploration with -- with Jay Young and MP2.
Q. And the right one says power arbitrage, do you see that?
A. I do.

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Q. And where did you learn about that?
A. From Todd Wilson at Calpine for the price and power Thomas Road.
Q. Did you learn about either of it from Mr. Storms?
A. No.
Q. So let's go to TX495. And now this is -- this is late October 2019. And K-W-A-L-A law is writing to you: "Michael, this has the potential to be a very big deal."
Do you see that?
A. I do.
Q. What is -- what is being discussed there?
A. So Ken Anderson, as I mentioned, is our advisor. He's a former utility commissioner, so very deeply aware of -- of ERCOT and the -- and the grid. I think he was excited about the prospect because the control load designation as the pure load had existed for a long time. ERCOT and no one had ever done it, so we were excited to be the first pure load to qualify.
Q. He's talking about a load-only Controllable Load Resource?
A. Yes, he is.
Q. Do you have an understanding of -- well, do you have an understanding whether Lancium was the first load-only Controllable Load Resource?
A. Yes, we were.

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Q. Let's go to TX1. So this is the '433 patent. You're the Michael McNamara named as inventor?
A. Yes, I am.
Q. Should Austin Storms be a named inventor on this patent?
A. No.
Q. Why not?
A. Because this patent was as a result of a lot of the innovation and hard work, as we talked about yesterday and the whole trial, and had absolutely nothing to do with anything that Storms has done.
MR. NELSON: All right. I pass the witness. Oh, sorry, I need to enter the exhibits first, I'm sorry.
Thank you, people, for not letting me mess this up twice.
The checked ones, right?
All right. Your Honor, we'd like to enter TX1, TX122, TX164, TX165, TX1 -- 170, TX171, TX172, TX173, TX174, TX175, TX176, TX177, TX178, TX179, TX180, TX209, TX210, TX211, TX212, TX213, TX224, TX233, TX234, TX255; TX261, TX262, TX263.
TX300, TX372, TX437, TX438, TX471, TX478, TX482, TX483, TX485, TX495, TX496, TX497, TX567, TX568, TX594, TX626, TX627, TX629, TX636, TX637, TX711, TX712, TX740, TX 741, TX742, TX743, TX744, TX748, TX749, TX750, TX756,

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TX757, TX758, TX763, TX764, TX767, TX770, TX778, TX795, and TX871.
THE COURT: Any objections?
MR. HORTON: We're trying to check, Your Honor, but to the extent those were the exhibits used with Mr. McNamara, no objection.
THE COURT: All right.

CROSS-EXAMINATION

BY MR. HORTON:
Q. Good morning, Mr. McNamara.
A. Hello, Counsel. How are you?
Q. Lancium didn't invent the CLR designation, did it?
A. No, we didn't.
Q. Lancium didn't invent the rules by which CLRs operate within ERCOT?
A. No, we didn't.
Q. You understand those CLR rules, don't you?
A. Yes.
Q. Lancium didn't invent the demand response programs in which a CLR can operate, did it?
A. No, we did not.
Q. Lancium didn't invent the Ancillary Services in which a CLR can participate?
A. No, we did not.
Q. Lancium did not invent the parameters of an Ancillary

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Services offer?
A. No, we did.
Q. Lancium did not invent the parameters of an Ancillary Services award?
A. No, we did not.
Q. Lancium did not invent ERCOT demand response programs?
A. We did not.
Q. MP2 was a qualified scheduling entity that Lancium was introduced to through a consultant named Jay Young, correct?
A. I agree.
Q. And that introduction took place in June of 2019, correct?
A. Yes.
Q. Lancium did not even know of the CLR designation prior to its introduction to MP2, correct?
A. Yes.
Q. MP2 informed Lancium of the ERCOT CLR designation, right?
A. Yes.
Q. You're aware, Mr. McNamara, that if a Load Resource is instructed to curtail by ERCOT, the load then sells its unused power back to the grid, right?
A. Well, I would say an LR doesn't get an instruction,

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I'd say the shunt trip is dispatched by ERCOT, at which point the entire load would go to zero at the meter under that shunt trip.
Q. Does the resource then sell that unused power back to the grid?
A. If it's on index it's not selling anything.
Q. So is that your testimony, sir, that the resource does not sell the unused power back to the grid?
A. If a Load Resource is on index and is dispatched by ERCOT, via the under frequency relay, not consuming any power has no power to sell back.
Q. Mr. McNamara, if a Controllable Load Resource is instructed to curtail by ERCOT, you understand that that Controllable Load Resource is able to sell its unused power back to the grid, right?
A. We have evaluated many, many, configurations of power purchase agreements, ancillary commitments, strategies, some ERCOTs products, some financial arrangements with QSEs, some financial arrangements with electric providers, or the generators.
In all those scenarios, the financial commitment or physical commitment may vary. And in no scenario is it ironclad to sell-back. It's really very complex.
Q. Mr. McNamara, you're not willing to say whether your '433 patent covers the activities of a Controllable Load

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MR. HORTON: So TX17, Page 7. If we can zoom in on the right.
BY MR. HORTON:
Q. It's continuing that discussion of that Power Option Agreement limitation. And the last paragraph there, Mr. McNamara, do you see that it reads: "Upon information and belief, Layer1's demand response contracts are Power Option Agreements."
Do you see that, sir?
A. I do see that.
Q. You agree with that statement?
A. Um, yeah, I would say I probably wouldn't phrase it this way today. But I see that now, yes.
Q. Let's look at TX96, please. Mr. McNamara, you mentioned during your direct examination SBI?
A. Yes.
Q. SBI was the first Lancium investor; is that correct?
A. No. We -- we had a friends and family seat around in December of 2017.
Q. And was SBI the first outside investor; is that fair to say?
A. They are a series A investor, yes.
Q. And SBI owns approximately 25 percent of Lancium; is that right?
A. Yes, that's right.

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Q. Do you recognize this e-mail?
A. Could you scroll down so I could read it, please.
Q. Well, let's just say this. It says here, Mr. McNamara, that you wrote an e-mail to SBI on October 21, 2019.
Do you see that?
A. Yes. Could you zoom in, thank you.
Yes, I see it.
Q. The subject line of this e-mail is about Thomas Road, correct?
A. I see that, yes.
Q. And Thomas Road is what Lancium refers to as its R&D facility, correct?
A. Yes, that's right.
Q. And the bold towards the bottom of this page, you see you bolded the heading "fixing the power price," right? Do you see that, sir?
A. Yes, I do.
Q. And you wrote to SBI, 25 percent stakeholder in Lancium, "when we originally entered into a power marketing arrangement with Calpine at Thomas Road, we asked for the cheapest option. This involved taking merchant power that is at a floating point rather than a fixed point."
Do you see that, sir?
A. I do.

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Q. You wrote that this seemed cheaper, and we thought it would give us more flexibility.
You wrote that, right?
A. Yes.
Q. Then you write, "this is true, but it misses a critical element."
Did you write that, sir?
A. I did.
Q. So you're telling SBI you missed a critical element, right?
A. I see it right there, yes.
Q. Presumably, though, you're about to tell them that you discovered the critical element, right?
A. It's in the next sentence.
Q. That's right. "When you fix the power price, you get the option to sell it back to the grid at the prevailing market price with Lancium keeping the spread."
Do you see that?
A. I do.
Q. Let's go to the next page at TX96. The first paragraph following that fixed power price subheading, you write to SBI, "We've fixed the price since mid-August."
Now this is referring to revised arrangement with Calpine, correct?
A. Yes, it is.

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Q. Okay. And you write, "now we constantly monitor the Real-Time Houston power price and will sell it back to the grid any time that grid price exceeds the revenue for mining."
Do you see that, Mr. McNamara?
A. I do.
Q. Okay. Let's look at TX125. Mr. McNamara, this is a Lancium prepared presentation for prospective investors; is that right?
A. It is.
Q. This presentation is dated May 2021?
A. I can see that, yeah.
Q. You're familiar with this presentation, aren't you?
A. I am.
Q. Let's look at page 4, please. This is the transaction summary slide, right, sir?
A. It is.
Q. And under "transaction size," do you see that, about midway through the slide it says, "Up to $200 million at issuer discretion."
A. Yes.
Q. Does that mean Lancium were seeking up to 200 million in investments?
A. We were.
Q. And you did raise 150 million, correct?

A. We did.
Q. Let's go to page 11, please. The third rectangle here, do you see that? It says "Smart Response software, best in class intellectual property."
Do you see that?
A. I do see that.
Q. And that best in class intellectual property would include the '433 patent?
A. I would agree with that.
Q. Okay. Let's look at page 15. I want to focus on the dotted box at the bottom here that says "bottom line."
"Bottom line: Lancium could take advantage of grid electricity price arbitrage to mine Bitcoin profitably as low as $3,000 per Bitcoin."
Do you see that?
A. I do.
Q. Was this electricity arbitrage also part of Lancium's best in class intellectual property, correct?
A. I don't know if I would characterize it that way. Um, our patent estate covers many different elements and functions, and arbitrage can be a separate thing.
Q. Let's look at page 35, please.
This seems to be breaking down various strategies in the far left column. Do you see that, sir?
A. I do.

Q. And there's a row entitled "ancillary services, dynamic pricing and optimization," correct?
A. Could you -- could you highlight that? Ah, I see, yes.
Q. Is this refer -- this is referring to CLR ancillary services, is it not?
A. A controllable load, like ours, can offer all four ancillary services.
Q. For CLRs, correct?
A. That's right.
Q. And you note here that you have an automated algorithm to maximum hourly ancillary services revenue, correct?
A. Yes.
Q. And that algorithm accounts for miner profitability, does it not?
A. Um, it has many elements. Mining profitability would be one, yes.
Q. And the next row down says "economic turndowns." Do you see that?
A. Yes.
Q. And you write here that "This occurs when you can sell-back your contracted power purchase for a higher price than the installed miner's computation breakeven."
Do you see that?

A. Yes.
Q. And then you provide an example of that analysis, correct?
A. Ah, yes.
Q. In the second column, you've got a dollars per year figure. Do you see that?
A. Yes.
Q. Were you explaining to your potential investors that these features -- let's take the ancillary services row first. Based on a 300-megawatt facility, those services would be worth $38.7 million?
A. At the time that was our expectation for the ancillary service price.
Q. And for the economic turndowns, the sell-back based on evaluation of the miner's computation breakeven, you valued that at $7.89 million per year, correct?
A. That was our estimate at the time, yes. Although I will say that it's not necessarily selling Real-Time power. It's the hash or cash concept. It's to marry different blocks of power at different intervals while backfilling the hash rate from OTC counterparties, which is different than what we were talking about.
Q. Is that written here, sir? Is that written here?
A. I think you'll see here in the description, it talks about that. So the interval at that time is next day, you

could do it a month later or a week later, any shape or product, it's in the example.
Q. Sure. Let's go to TX107. Mr. Nelson showed you this e-mail, correct?
A. Would you zoom? Thank you.
Q. Mr. Nelson showed you this e-mail, sir, correct?
A. Yes, he did.
Q. And it's dated August 16, 2019, right?
A. Mm-hmm.
Q. "This is cool. We now have two revenue sources: Bitcoin mining and selling power back to the grid."
A. Yes.
Q. You write "we now have two revenue sources," correct?
A. I see that there, yes.
Q. I thought I heard you say during your direct examination that this was a capability that you achieved only because of the fixed price agreement with Calpine.
Did you say that?
A. Yes, I did.
Q. So in your view, the sell-back has nothing to do with miner profitability. Is that your testimony, sir?
A. Sorry, say that again.
Q. The sell-back that's discussed in this e-mail, is it your testimony, sir, that it doesn't include an evaluation of miner profitability?

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A. Un-huh, yep.
Q. And then from about a year ago till now, your title has been vice president of power markets, right?
A. Yes.
Q. So as to your relationship with Mr. Storms, could you just describe generally what the nature of that relationship was, like how it -- how it started?
A. So I think my memory is that we were introduced to him through Ben. And Austin had more technically detailed knowledge of the mining systems. And also, the -- like, things like the secondary market for the systems. Like, he's the one who told us that just buying a bunch of old ones from China really wasn't a practical approach.
So, I mean, I think Ben knew some of that. I think Ben knew maybe all of it -- and this is just my sense. But we probably understood the marketing side better than -- much better than either of them. And I think Austin understood the -- the technical nature of the miners and -- and the electricity support systems way more than the rest of us. That would be -- that would, I guess, be my best summary of it.
Q. So this Exhibit 92 starts on Page GlidePath 362 and goes to GlidePath 363.
Do you see that, two pages?
A. Yep.

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Q. Yeah. And does this appear to you to be a true and correct copy of this e-mail chain?
A. Yeah. So I looked at this e-mail because it's easier to read because it's color-coded. So, I mean, this looks like the same e-mail. So this -- what happened is that Austin sent an e-mail and then I replied with comments in bold red, and I think this is that replied e-mail that has my comments in it.
Q. And you see the subject of the e-mail is "Day-Ahead versus RTBM LMP biz requirements and data questions," right?
A. Yep.
Q. And RTM -- sorry, RTBM, what does that stand for?
A. This is what I talked about a little bit earlier. There's the Day-Ahead Market and the Real-Time Balancing Market. And LMP stands for Locational Marginal Price.
Q. So in this e-mail, Mr. Storms is asking you and Mr. Hoadley and Mr. Vickery a series of questions about Real-Time pricing and Day-Ahead pricing, right?
A. Yes.
Q. And, in fact, Mr. Storms is asking you about how the wholesale power markets worked, right?
A. Yeah. I would say coming into this, he had a fairly decent layperson's understanding of how the markets worked. But when you -- again, sort of what I was describing about settlements earlier, the details can become very complicated

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depending on the ISO.
So I think he was -- he was asking to sort of clarify some of these details. So I don't -- I don't want to make it should like he didn't understand anything about the energy market, but I think he was trying to -- to fill in some of the -- you know, the details of -- of his understanding.
Q. And if you look down at the e-mail, the second full paragraph, it says: "From my understanding, the Day-Ahead LMP dollars per megawatt hour is calculated based on forecasts, estimated demand, and the RTBM LMP dollars per megawatt hour fills the gap between the estimated demand in Day-Ahead Market and actual demand in Real-Time... is this correct?"
Is that the question that Mr. Storms was asking?
A. Yeah. Again, it's a question that pretty -- you can -- if you're involved in the markets, you recognize, like, it is a layperson question. So, yeah, I would -- I would say that I kind of understood what he was getting at, but that it wasn't -- it wasn't quite right.
Q. And why wasn't it quite right?
A. Well, because, again, it's -- it's a clearing model, so it's not really forecasts. It's, you know, based on bids and offers. So it's not really so much -- I mean, to some extent, there's forecasting being done, but it really is the

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clearing of a market.
Q. And is that what you were explaining to him in your -- in your answer that begin with "sort of"?
A. Yes, that's what I'm trying to explain.
Q. And in your answer -- so in your answer, you're trying to correct Mr. Storms' understanding?
A. Yeah, I'm -- I guess I would say I'm trying to expand his understanding. Like, again, I think he has a -- like, if you go to the ISO and you read things, you will have a certain level of understanding, but the mechanics of it, you know, start to get complicated.
So I was really more trying to, you know, not so much staying, like, you're wrong, but it's just -- it's not quite that. So, you know, like, here -- here are some of the reasons why.
Q. And, in general, you told him in this paragraph how settlements with independent service operators work; is that right?
A. I'd say it's more specific than not.
Q. How so?
A. I think what I'm specifically saying is -- I'm not giving a lot of details, I think I'm specifically saying, depending on how you're operating, like, if you're a load that pulls power off the grid when you want to run your miner, or if you are co-loaded with a generator and you're

diverting power from that generator to feed your miner, what -- what do you want to compare?

And if you take action in the Day-Ahead Market based on prices, how would -- how would you then -- how would that affect your dispatch in real-time?

So I think I'm -- I think it's focused primarily on that as opposed to a more general description of -- of how the -- how the ISO settle.

Q. And in this specific context, what does dispatch mean?

A. So dispatch, in the context of a miner, means if you're above your breakeven price -- if the LMP is above the breakeven price, you don't want to be mining. You want to either not buy that power from the grid, or if you're -- if you have a generator, you want to sell that power to the grid.

If the LMP is -- that -- so that would be dispatching your miner to zero. If the LMP is less than your breakeven price, then you would want to turn on the miner. And if you're -- if you're a wholesale load, buy that power from the grid. Or if you had a generator, divert that power from the generator that would otherwise sell it to the grid, and use it for your mining operations.

Q. And that's what you're referring to as energy dispatch?

A. So, I would call that -- what I'm referring to is dispatch of the miner. But the ultimate dispatch of the -- of generators. So that -- so depending on the context, those mean different things.

Q. Can you explain to me how?

A. So, for example, if -- let's make it simple. There are no renewable energy credits so there's no production tax credits. If the LMP is less than zero, you don't want to run your wind farm, because you actually have to pay the ISO to take your power. So you would dispatch your wind farm down to zero.

If prices are greater than zero -- and assuming you cover your variable O&M, then you want to bring your generator up, potentially to its full capacity, because you're getting paid something.

Now, this gets a little tricky because sometimes the output of your actual generator could affect local pricing because of constraints. So it can get a little tricker than that. But, basically, you don't want to run your generator when you're losing money.

Similarly, with a Bitcoin miner, you don't want to be mining Bitcoin if the energy to run the miner is greater than your expected payout.

Q. And why not?

A. Because you'll lose money. So let's say your

breakeven price -- so your expected revenue per megawatt hour is $30 for mining Bitcoin. If power prices are $60 and you choose to run your miner that hour, you lose $30 per megawatt hour, so you don't want to do that.

Q. So you would have to pay $60 -- in your example, you'd pay $60 for electricity but you'd only make $30 in Bitcoin mining, and so your net revenue would be negative $30?

A. So you want to -- you want to just turn your miner off and just sell that power to the grid, or don't buy power from the grid in the first place.

Q. And was that an idea that was new to you at the time of this e-mail in April 2019?

A. That was definitely not a new idea. Anybody who is in power markets knows you -- you curtail your unit when you're losing -- again, I think that's probably true in any operations. When you're losing money in the margin, you don't want to produce.

You know, sometimes, like nuclear units might lose money for a few hours, or coal units, because they take so long to cycle so you might lose a few -- a little bit of money in the off -- in the early hours to make a lot more money in the -- in the -- during the peak of the day. But over a time frame, the unit can be dispatched, you know, practically. You -- you turn the thing off if it's losing

money. That -- I think that's a pretty universal concept.

Q. All right. Let's go back to the e-mail we were looking at on Page 362 in that -- that second full paragraph with the -- the longest response, I guess, there from you in bold.

A. Yep.

Q. And I wanted to focus you on the first sentence. So you say: "You would first want to calculate a breakeven power price."

Do you see that sentence?

A. Yep.

Q. And by breakeven power price, what did you mean?

A. What I meant is the power price that you need to run the miner at to make an expected profit. That is, your expected revenue from putting that 1 megawatt hour of energy into your Bitcoin mining has to be greater than that number of the breakeven price or you shouldn't be running the miner.

Q. And then the next sentence says: "This will depend on the power efficiency of your units and the expected revenue per terahash."

Do you see that?

A. Yeah.

Q. So what's the power efficiency of your units? What does that mean?

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A. So in this case I'm talking about the miners themselves. So miners are typically quoted as, like, terahash per megawatt hour or terahash per kilowatt hour. So it's, like, how many terahashes you can do per unit of energy.

And then, again, as Bitcoin -- most of these cryptocurrencies evolve, your revenue per terahash goes down because they make the problem harder and harder as more and more of -- of -- of the Bitcoin gets mined.

Q. Okay. And then the next sentence says: "Let's say this number is estimated to be $30 per megawatt hour. And when you say "this number," what -- what number are you referring to?

A. The breakeven.

Q. The breakeven. And it says -- next line is -- or next sentence is: "You would either bid DA load at $30" -- and when you say "DA load there," you mean Day-Ahead load?

A. Yep.

Q. Is that right?

A. Yep.

Q. And then in parenthesis it says: "I.e., you receive a schedule to draw a load if the DA LMP is less than $30." And then it says: "Or you offer a block of generation equal to the capacity of your miner at $30."

Do you see that?

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A. Yeah.

Q. Can you explain what that means?

A. So, again, this e-mail's from a while ago, but I think what I'm answering in those two questions are two possible configurations. The first being your wholesale load, so you actually have to buy your energy from the grid or the market.

And the second one is, when you're colocated with a generator where you can just divert energy from the generator in lieu of selling that power to the grid.

So in the first case, I'm basically saying if you -- if your breakeven price is $30 and you put in a Day-Ahead bid to buy energy at $30, you will only clear if that Day-Ahead LMP is less than $30. And then that's the price you pay for the energy you take. If you take more or less energy than that, there will be an imbalance. But the only reason you would take less is if power prices are much higher.

So let's use the previous example. Let's say -- let's say Day-Ahead clears at $20, so you're like, yes, I want to run my Bitcoin mining at $20 because I'm making $10. And then in Real-Time it goes up to $60. So then you say, well, I don't want to run by Bitcoin miner at $60. But I have this contract, basically, to buy it at $20, so I want to run the miner. Actually, you don't. Because if you turn

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the miner off, there will be an energy settlement where you pay $20 for the energy, but they pay you 60 on the imbalance.

So, basically, you bought Day-Ahead at 20, but now you need to cover that, so you're selling back -- you're selling that power that you're not going to use back to the market at the Real-Time LMP of 60. So you're -- if you just do the math, and you can do this in the call, you're making $40 as opposed to $10.

So your decision to dispatch the miner, turn the miner on or off, is really going to be based on the Real-Time LMP, regardless of what you do in the Day-Ahead. But you still may want to take action in the Day-Ahead because it just gives you a little more certainty and, you know, potentially an opportunity like this.

Q. So I want to make sure I understand this. So there could be a time when the difference between the Day-Ahead price that you purchased electricity for and the Real-Time price is great enough that it makes more economic sense to sell the power -- effectively sell the power back to the grid rather than to mine the Bitcoin; is that right?

Just so the court reporter is clear, what was your answer to that question?

A. Yeah. That's the general idea, is, rather than mining Bitcoin, which only gets you $30, sell it back to the

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Real-Time -- sell it back in the Real-Time Market and get $60. And then you would have to pay the Day-Ahead price, $20, anyway. But it's all -- more profitable by selling it back to the Real-Time Market.

Q. And that's part of the information that you're communicating to Mr. Storms in this e-mail, Exhibit --

A. Yeah.

Q. -- 92?

And, again, what was your answer?

A. Yes.

Q. So if you go to the -- the very top e-mail of the first page of Exhibit 94, which has, in the lower right-hand corner, GlidePath 311 as the control number, you'll see it's an e-mail from you to Mr. Storms dated May 22, 2020, right?

A. May 22, 2020, yes.

Q. And in this e-mail -- well, could you explain to me what -- what -- what you're expressing to Mr. Storms in this e-mail?

A. Right. So -- so, basically, you know, he's interested in, like, finding out if we're interested in going forward with this; namely, buying, like, a package mining system from him.

And, you know, we're talking about, you know, doing some high-level economic analysis of it. And, you know, one of the things that we needed from him were, like,

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money could be made mining Bitcoin and determining whether or not it would be profitable, right?
A. Correct.
Q. So you walked Austin Storms through these models, right?
A. I don't recall if I walked him through the models, meaning I -- I -- we both had them up on screen. I sent them to -- I sent them to him, and I believe that he reviewed them.
Q. And what was his reaction, if any, to these meddles?
A. I don't recall.
Q. All right. Go forward with me to 3975.
All right. You see, in the middle of the page, a text you wrote April 5, 2019. You said: "Yo, was just thinking about this. It would be super cool to write a little Python script that ran on the UPS at the mining site that looked at the LMP (locational margin price) pricing at the grid node that the wind farm feed and power on/off, based on whether or not the LMP is above or below, so $0.03 per kilowatt hour."
Do you see that?
A. Yes.
Q. That was an idea that you had?
A. Yes.
Q. And you sent that idea to -- to Mr. Storms, and

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then -- correct?
A. Yes. I had sent this text message to Austin.
Q. And then you also then gave him -- sent him a link to this website from the Southwest Power Pool.
A. Yes.
Q. So the website that you were sending him on page 3975, what was -- what was at that web location, to your recollection?
A. I recall that that had data for the price to deliver energy to a specific node on the Southwest Power Pool.
Q. A specific node is a specific geographically location, correct?
A. Correct.
Q. And in your text above that hyperlink, you say that "the Python script would run on the UPS."
What is the UPS?
A. The UPS is an uninterruptible power supply.
Q. The idea here is that you would look at the pricing of power, and you would determine whether or not to mine based on whether or not it was profitable based on the price of power, correct?
A. Generally, yes.
Q. And you said, "seems pretty simple to prototype," right, as the next text?
A. Yes.

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Q. And then Austin Storms replied and said "what is LMP," right?
A. Yes.
Q. And you told him what LMP was, right?
A. Yes.
Q. Go to the next page, 3976, top of the page. And then you're talking more to him on this same subject. And at the top of the page, the first full text there, it says, "Ya, so if you have a PPA, I don't think you care about this."
Do you see that?
A. Yes.
Q. And a PPA is a power purchase agreement?
A. Yes.
Q. What's a PPA?
A. My understanding is that a PPA is a long-term contract to purchase or deliver power. It's a bilateral agreement between people who are generating power and people who want to purchase power over a period of time.
Q. How did you know what a power purchase agreement was?
A. I had worked with GlidePath, and I had read some books.
Q. Do you have any reason to think that Austin Storms had ever heard of LMP before your text messages with him about it?
A. I think it's very likely he had already heard of

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that.
Q. And you think that's true, even though on page 3975, he texted you, "what is LMP?"
A. I don't know if he -- if it wasn't quickly being recalled by him. I can't say. I don't know.
Q. Was it common practice for Austin to ask you questions about what things meant when he already knew them?
A. I don't -- I don't know, or I don't -- I don't recall.
Q. Go to the next page, 3979.
Do you see in the middle the page there's a text from Austin Storms, April 11, 2019, 12:11 p.m.
Do you see that one?
A. Yes.
Q. And he's talking about -- well, he says, "Let's talk some about the LMP check when you get a chance. I think I can model profitability of mining with LMP logic over a week or so versus just selling at LMP."
Do you see that?
A. Yes.
Q. In the next line he writes, "If so, that's a game changer. We can develop it together to sell the system or full IP to the highest bidder."
Do you see that?
A. Yes.

Q. Did you have any discussions with him about developing it together and selling the full IP to the highest bidder?
A. I don't recall. And I don't think so.
Q. Did Mr. Storms ever talk, other than here, about selling his IP?
A. I don't recall. And I don't think so.
Q. Same question for licensing his IP: Did he ever talk about that?
A. I don't -- I don't recall those conversations, and I do not think we discussed that.
Q. Did he ever talk about the monetary value of his intellectual property?
A. I don't think we talked about that.
Q. When -- when -- in this text from Mr. Storms, when he talks about "sell the system or full IP to the highest bidder," did you understand him to be talking about intellectual property there when he's talking about IP?
A. Yes.
Q. Have you ever heard of the term "economic dispatch"?
A. Yes, but I don't think I could explain it to you.
Q. Do you know where you heard it?
A. Probably in one of those books I read.
Q. All right. Go back to Exhibit 8, the page that begins on the bottom of 3981 and continues on to the top of

3982, from Mr. Storms to you.
It says, "Definitely. I still need to get clarification on Real-Time LMP versus Day-Ahead LMP regarding business requirements, too."
Do you see that?
A. Sorry. What -- what page is that?
Q. Top of page 3982.
A. I see that.
Q. So he's seeking -- he says he still needs clarification on Real-Time LMP and Day-Ahead LMP, correct?
A. I don't know what you're -- I don't know what the question is stating.
Q. I mean, am I reading this right, that Mr. Storms is saying, in this text, that he still needs clarification on Real-Time LMP versus Day-Ahead LMP?
A. He needs to understand business -- if there are different business requirements for the two.
Q. Do you know if he ever figured it out?
A. I don't know.
Q. Go down to the middle of that page, 3982. There's a text from Mr. Storms to you, 7:18 p.m. It says, "I got the model running. Going to check it when I get home."
Do you see that?
A. Yes.
Q. The next line it says, "This is one of the coolest

somethings I've ever put together FYI."
Do you see that?
A. Yes.
Q. And when he's talking about "this ," he's referring to the model, correct?
A. Yes.
Q. And he says, then, "thanks for the idea."
Do you see that?
A. Yes.
Q. So he's thanking you for giving him the idea for the model, right?
A. I don't know exactly what he means by that.
Q. How did you interpret it?
A. I think that the conversation that we had previously sparked ideas that he could develop -- that he could build this.
Q. Is Exhibit 18 the picture that is shown in the text message on page BB 100003982?
A. I believe it is.
Q. And this is the model that we've been talking about, right?
A. Yes.
Q. And this model takes in Real-Time LMP and uses it to calculate or project the profitability of Bitcoin mining, right?

A. Yes.
Q. Do you think this was your idea or Mr. Storms' idea, this model?
A. I didn't build this and wouldn't have known how.
Q. Did you know of anyone else who was -- in Bitcoin who was doing LAAS, L-A-A-S, at that point?
A. I don't know.
Q. You don't know if you knew or you didn't know of anyone else doing it?
A. I don't recall if I knew that anybody else was doing it, nor did I know if anybody else was doing it.
Q. All right. So then the next text is from you, and it say, "it's so cool, man. I just can't get over the fact of your Real-Time pricing grid notes."
Do you see that?
A. Yes.
Q. Do you recall whether or not you edited any of Mr. Storms' code?
A. No, I did not.
Q. All right. Go to 3996, please.
MR. LABBE: What page now, Chad?
MR. STOVER: Sure. 3996, I think it's a couple of pages ahead in Exhibit 8.
BY MR. STOVER:
Q. Are you there?

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software projects you worked on?
A. Yes. So I developed different military applications for sensors and trained applications on different testing applications for LEDs, for networks. I worked on medical devices. I worked with Real-Time operating systems and developing Real-Time operating systems, and I also developed software analysis tools.
Q. And what do you mean by "Real-Time operating systems"?
A. So Real-Time operating systems are a type of operating system that are used typically on devices, and they, as the name implies, operate in Real-Time, usually with real world inputs and outputs and then -- yeah, so our more typical devices.
Q. And what kind of software analysis tools have you worked with?
A. Different tools to analyze and compare source code and then to look at different aspects of software development.
Q. And have you worked with different programming languages?
A. Yes, many.
Q. And what are some of the languages you've worked in?
A. Many languages, but those would include Python, C, C++ and JAVA.

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Q. And Python is the language that the source code in this case is written in, right?
A. Yes.
Q. What do you do currently?
A. I currently work at Baer Consulting which I founded in 2012.
Q. And what's the nature of your work at Baer Consulting?
A. Well, Baer Consulting provides services for examining and analyzing software and source code and -- and the development of software and source code as well as -- yes, both the analysis but also some development of source code software.
Q. And other than your work in this case, have you worked as an expert in litigation before?
A. Yes.
Q. And about how many times have you served as an expert in software?
A. About 15 times previously.
Q. And other than your work as an expert, have you had any other work related to litigation?
A. Yes. I was appointed a special master in a matter ECIMOS First Carrier where I worked for Judge McCall in the Western District of Tennessee.
Q. And what was the nature of your role as special

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master?
A. Well, I was overseeing the redevelopment of a system after there had been issues of copyright and trade secret in a jury trial.
Q. So did your role as special master involve the review and analysis of source code?
A. Yes.

MR. KAUFMANN: Your Honor, at this time defendants tender Mr. Baer as an expert in software and source code development and analysis.

MR. HORTON: No objection, Your Honor.

BY MR. KAUFMANN:
Q. Mr. Baer, can you summarize the opinions that you formed in this case?
A. Yes, and if we could -- yeah.

So my opinion is that the BearBox source code does not support the conception of the claims of the '433 patent.

I reviewed every file and line of the BearBox source code. And it all can generally be categorized in three main categories, and none of those categories and none of the code had the functionality or ability related to several claim elements of the '433 patent.
Q. So did you say you reviewed all of the source code that was produced in this case?

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A. Yes, I reviewed every file, every line of the source code. I also reviewed various documents, you know, the e-mail and its attachments that were sent and, you know, different -- Dr. McClellan's report, for instance.
Q. And can you summarize what the three categories of the source code, the BearBox source code that you identified, what those are?
A. Yes, and if we could advance the slide.

So three main categories were source code for -- for testing a using interface that would provide some manual control of a power distribution unit or PDU. The second was source code for retrieving publically available Bitcoin mining and power pricing data, and the third was source code for providing simulation, comparing profitability of mining Bitcoin versus selling power.
Q. And starting with that first category, can you explain what that PDU software does?
A. Yes. And if we can advance. Yes.

So the first category is the source code for testing a user interface, and I think we saw some screenshots of that previously in other testimony. But essentially drawing the interface with some buttons on an application, a window on a computer screen that could -- through which a user could manually control the relays of a PDU, turning -- turning the -- the outlets or the relays of

the PDU on or off.
Q. And so when you say "manually," that means the user actually has to physically, like, click a button on the screen?
A. Yes. Essentially these files were, you know, buttons on a screen, which a user could press.
Q. And is this category of the source code related to any of the other two categories?
A. No, no. And, I mean, specifically in software and source code, you can link files or import between different files and, these ones were not linked or associated with the files from the other categories that I described and we'll discuss.
Q. How, if at all, does this category of the BearBox source code relate to the '433 patent?
A. I don't know -- I don't see the source code relating to the '433 patent.
Q. And were you in the courtroom yesterday when Dr. McClellan testified?
A. Yes.
Q. And do you understand whether Dr. McClellan discussed any of the source code in this category?
A. I think he -- there was a display of some of the screens, but I don't think he discussed any of the source code.

Q. And other than the functionality of this code, is there any other reasons why you believe it doesn't relate to the '433 patent?
A. Yes. I mean, these PDU interface files are all dated after May 3rd, 2019.
Q. And what's the significance of that date?
A. I understand that that is when the dinner occurred between Mr. Storms and -- or that the dinner occurred that included Mr. Storms and Mr. McNamara.
Q. And now I'd like to talk about the second category of the source code you identified. And can you summarize, again, what that code does?
A. Yes. So the second category of code included source code for retrieving publically availability Bitcoin mining and power pricing data, essentially automating the process by which one would retrieve information from the Internet or, you know, similar to someone just simply Googling information.
Q. And the files you've listed on the screen, are those some examples of that category of the source code?
A. Yes. I mean, here I have listed DA LMP import.puy. Puy is the file extension for a Python programming file, so this is the Python file DA LMP import. Below that is DA LMP import ABC.puy, and then LMP CSV import.puy.
Q. Those files are imported in Exhibit 20; is that

right?
A. Yes.
Q. And the middle one is Exhibit 34?
A. Yes.
Q. And do you have any examples of what this code actually does?
A. Yes, if we can go to the next slide.
Q. And can you explain what you're showing here?
A. So, here, again, is we're looking at the retrievable and publically available data, and this is pulling historical power pricing data. It is an example of one of the Python files, DA LMP import.

And we see the series of instructions that are in the Python source code. One way of organizing the source code is into methods, which we see the method, get Day-Ahead LMP starting at line 17.

And then what I have highlighted at line 23 is the setting of this variable URL to a web address. It's a web address at marketplace.spp.org, and the file used is this web address to go pull this CSV, which is essentially just a data table from this web address.
Q. And is this example representative of this category of the source code files?
A. Yes, and the retrieving of public data.
Q. And now I'd like to talk about the third category you

identified. And could you remind us again what that was?
A. Yeah. So the third category is the source code that provides a simulation for comparing profitability of mining Bitcoin against the selling of power.
Q. And can you explain the analysis that that code does?
A. Yes, if you could proceed one more.

So I created this logical flow chart that describes the operations of this category of source code, essentially retrieving these publically available pieces of data in these price points, the Bitcoin mining parameters, the power price point for Day-Ahead and Real-Time, LMP, and then making a determination by comparing those price points and the potential profit of mining Bitcoin to determine whether to mine or not. And -- yes.
Q. And this is -- this logic that you summarized here, this is implemented in BearBox code; is that right?
A. Yes.
Q. And where is that implemented?
A. So if we -- so this is an example an excerpt from the file Denis underscore logic. And this excerpt is the main method in computer science and programming. It's just a general practice to have your main operations, your main logic, at least start or be within a method called the main method. And so this -- these instructions performed the operations of that logic that I just -- that were just

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Q. And the breakeven calculation includes a value kilowatt load or KW load; is that right?
A. Yes.
Q. And is kilowatt load a value that is received by the code?
A. No.
Q. And so after doing this breakeven calculation, what does the main function do next?
A. Sure. So if we can show the next slide. There is a call to a method profit comp controller, which -- which performs, I think, most of the determination, most of the logic that I have in this diagram.
And if we can go to the next slide.
So this -- this shows the -- the instructions of the profit comp controller, and it illustrates -- and the -- the diagram illustrates the actual instructions that occur in -- in this function.
We can see at line 98 a comparison of Day-Ahead LMP to the breakeven point. And I have that reflected in the diagram in the first diamond, the first decision point -- or determination, where if the Day-Ahead LMP is greater than the Bitcoin mining profit, than a determination is made that it's more -- it would be -- I mean, more profitable to -- to sell the power.
And so, as illustrated in the diagram, the logic

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flows to turning all of the relays of the PDU off. You can also see that at line 99 of the source code. Immediately following that determination is the instruction PDU 1 all off, which would turn all the relays of the PDU off. And if miners were connected to the relays, that would turn them off as well.
I mean, the next logical decision point is at line 102 of the source code, and it's the second diamond in the logic diagram. And it's comparison of the Real-Time LMP to the breakeven point. And -- and here, too, if the Real-Time LMP is found to be greater than the Bitcoin mining profit, then the decision is made that all the relay should be turned off. And so, again, we see a call to PDU 1, all off, to turn all the PDU relays off.
Finally, if those two conditions are not true, the logic proceeds to -- it would be line 111, and that would -- would turn all -- what we call PDU 1 all on, which would turn all the PDU relays all on.
And at that point, the logic has determined there is a higher profitability for mining Bitcoin, and so the PDU relays would be turned on. And so this is the logic that is illustrated here and that is modeling the comparison of Day-Ahead LMP to Bitcoin mining profit.
Q. Okay. And so then what does the main function do after that analysis?

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A. Sure. So if we can pull up the next slide. So after that, the main function, it calls a method_get_profit to determine some potential revenue values. And then it picks a realized revenue value from those potential revenue values and it stores those calculated values and some of the other retrieved values into a database table, much as one would write another row in an Excel table.
Q. And is this a table like the spreadsheet that's attached to this e-mail Mr. Storms send to Mr. McNamara?
A. It would be something like this. I don't know if all the names of the columns exactly coincide, but it would be something like this, yes.
Q. And so then after this step, what does the code do next? Or what happens --
A. Yeah, if we can proceed.
So the -- the main method -- the next part is the end of this Denis_logic file. It's less than 200 lines long. And the main method runs under this instruction, this is a while loop, which -- which will keep calling the main method to run the simulation, as long as it's true.
But -- but after calling the main method, there is a command at line 187 to sleep for 300 seconds. So essentially the simulation runs and then the program -- the program will sleep or pause for 300 seconds, which is five minutes. And then it will repeat.

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Q. And is that sleep time a value that's received by the code?
A. No, that is a value that is set and -- and fixed in this -- in this code.
Q. So if you wanted to change that sleep time, how would you do that?
A. You would have to change the -- change the code, change the program.
Q. And is the sleep time value associated with an amount of power?
A. No.
Q. And the file that we just walked through is called Denis_logic; is that right?
A. Yes, Denis with one N, yes.
Q. And are there other categories of -- there are other source code files that fall within this category of this simulation code?
A. Yes. And if we could proceed. So there were -- there were several files that were substantially similar to the version of Denis_logic that we just went through. There was a second version of a Denis_logic.PY, there was a Denis_logic_newgen.pY, there was a file test_profit.py. There was a file ARBmainAC.PY and then a minor_amort_breakeven.PY.
Q. And those files you just identified, those are

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Dr. McClellan's testimony?
A. Yes. And if we can proceed.
Q. What are you showing on this slide?
A. So, you know, one of the things Dr. McClellan testified on was the presence of these various parameters. These are -- these are different Bitcoin -- or bit mining parameters.

And I just wanted to clarify that although these different variables are written in the code, the operation of the code only actually uses a single parameter. It only uses, as I've illustrated, the instruction get breakeven USD per kilowatt hour.

When it's called on line 187, it only receives the KW S9, it doesn't receive the other values. So it's, therefore, only operating on that single value.
Q. And that value, the minor kilowatt load value, is that a value that's received by the code?
A. No.
Q. And is the miner kilowatt load value an amount of power that the system must use in -- in the code?
A. No, it's just the variable KW load I discussed before. It's just a fixed value. It represents an estimated power usage of the miners but it's not a required amount of power to be used.
Q. And then so what you called out there at lines 13

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through 31, there are different KW values, do you see that?
A. Yes.
Q. And so other than that first one that you've highlighted at line 14, are any of those other KW values ever used anywhere else in the code?
A. No, no. They are defined here or set here, but the code only operates, only uses the one value, KW_S9.

THE COURT: So, if I may, so is it not receiving, operating on network hashrate BTC price equals other identified up, in I guess that's line 188, all those other things identified up there.

THE WITNESS: Yeah, so it calls and retrieves the BTC price, as illustrated by calling network BTC price that goes out to the URL. But what it's not receive is this KW or this kilowatt value that is set in code. It's set once and it's not changed and it's not received.

THE COURT: Okay. But did you hear Dr. McClellan yesterday talk about compiled versus interpretive code and somehow saying that -- what I got from his testimony was that somehow that value can be changed through -- because logic -- because Python is an interpretive code, and somewhere else in the operation that value could become more dynamic.

THE WITNESS: Yeah, I did hear that. And that is -- number one, that would be essentially still changing

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the code. That's not something that's normally done. That was -- it's just that it would be easier to just hack the code or kind of like break into the code and change that value while it's running once it's in the interpreter.

I mean, the very typical flow of code, even if it's interpreted as it goes into the interpreter, which is then executing the code, and it's just extreme -- like, very poor practice to be trying to break into the code and manipulate something.

So that is not how one builds a system and it's certainly not designing for -- it's certainly not designed to how the value is changed. Just because someone could decompile or break into a piece of code doesn't mean that that's what would be intended or what the normal operation would be.

THE COURT: Okay.

BY MR. KAUFMANN:
Q. Mr. Baer, are there any other aspects of Dr. McClellan's testimony about the software code that you disagree with?
A. Yes.
Q. And what are you showing on this slide?
A. Yes, so here I walked through the logic diagram, I showed how the method profit comp controller calls PDU 1 all off or PDU 1 all on, and how those will turn on and off all

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the PDU relays, those instructions are -- are only turning all of them on or all of them off.

I think there was some testimony about an ability to turn off a portion or individually, and that is just not included in this -- this logic.
Q. So does the BearBox source code, the simulation files ever instruct only a portion of the PDU relays to turn on or off in the system?
A. No. This -- the BearBox simulation code only ever instructs all the PDUs to turn -- or all the relays of the PDUs to turn on or off.
Q. And so is there any other source code that allows for turning on or off individual miners?
A. There is. So in that first category, the -- the user interface with the buttons, someone could manually use that to turn selected PDUs on our off. But in terms of the simulation -- or the logic of this code, there's -- there's no -- there's no availability of turning PDUs all on or all off.
Q. So is that user interface code ever called upon or used in this simulation?
A. It is not, no.
Q. And does the logic that's used in the simulation ever provide a reason to turn on or off only a portion of the relays or miners that might be connected to those relays?

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A. No, it does not. I mean, the logic is making the determination of whether there's a greater profit from a Day-Ahead -- from -- from selling the power, which would require turning all the PDUs off, or mining the Bitcoin, which would be turning all the PDUs on.

So there's no incentive, there's no concept, there's no reason why following this logic and the logic that's in this source code, why one would -- would ever want or why there would be a need to turn off a portion that would undermine the logic of this.

Q. And, Mr. Baer, have you formed opinions on whether the BearBox source code demonstrates conception of the inventions of the '433 patent?

A. I have.

Q. And what are those opinions?

A. Yes, so if we could proceed. I mean, my opinion is that the BearBox source code does not demonstrate conception of the '433 patent. And looking at Claim 1 of the '433 patent, it discusses a system that receives power option data where the power option data includes a set of time intervals where the time intervals are associated with minimum power thresholds.

And looking at the BearBox source code and -- you know, I have again the logic display that the BearBox source code performs, but the BearBox source code does not

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receive data specifying a minimum power threshold.

Q. And how did you determine what a minimum power threshold was in forming your opinions?

A. Well, I followed the plain and ordinary meaning of the term in the patent, as it was described in the patent.

Q. And are you aware that the Court has construed the term "minimum power threshold"?

A. Yes.

Q. And did the Court's construction impact your opinions at all?

A. No.

Q. And does the -- are there any other reasons why you believe the source -- source code doesn't support conception of the receiving power option agreement -- or the limitation regarding receiving power option data?

A. Yes, if we can proceed to the next slide.

So along -- well, the -- the instance of -- or the notion of power in the BearBox source code is just this fixed value, this KW load, it's fixed, it's not received, it's not altered. It's set once and it runs. And it's simply an estimate of the amount of power that the miners might use.

So for that reason as well, the BearBox source code does not receive data specifying minimum power thresholds.

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Q. And do you consider that kilowatt load value to be a threshold value?

A. No. Again, it's just an estimate of the amount of power that the miners could consume. It's not a -- it's not a value that's received, it's not a value that's measured, and it's not a value that's changed as the code operates.

Q. And does the kilowatt load value have an associated time interval?

A. No.

Q. And is there any concept of time intervals in the source code?

A. Well, the -- the source code cycles. Every 300 seconds there's this sleep instruction. But that is, again, a fixed value; it's not a value that's received, it's not a value that's set as the code operates. It's simply a fixed value that's set once and for how long it should sleep in between executing the main logic.

So the BearBox source code does not receive data specifying a time intervals.

Q. And are there any other aspects of Claim 1 of the '433 patent that you believe are not reflected in the source code?

A. Yes.

Q. And what are you showing on this slide?

A. So Claim 1 also includes that the system is

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responsive to receiving the power option data and -- and determines a performance strategy that comprises a power consumption target for a set of time intervals.

And we've before -- I've explained the -- the logic of the main function of the BearBox source code simulation. And the BearBox simulation source code does not receive minimum power thresholds, it does not receive time intervals, it does not determine a performance strategy based on a minimum power threshold, it does not set instructions based on a minimum power threshold, and it does not monitor power consumption.

Q. So what is it that the -- that simulation does do?

A. The simulation simply models the profitability of mining versus selling power.

Q. And, Mr. Baer, have you formed opinions about any of the other claims in the '433 patent?

A. Yes.

Q. And what are you showing on this slide?

A. Yeah, so Claim 17 is another independent claim. And for the same reasons as Claim 1, the BearBox source code does not demonstrate conception of Claim 17 of the '433 patent.

Q. And did you also consider Claim 20?

A. Yes. And so if we can -- yeah. So for Claim 20, it is another independent claim. And for the same reasons as

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A. Yes, it is.
Q. And so can you explain what the horizontal green lines annotations are intended to represent?
A. Yes, those are the minimum power thresholds, which means in this exemplary figure on an hourly basis, the load must at least consume this much power subject to curtailment initiated by the power provider, which could be anywhere from the minimum power threshold to zero in a granular way.
But the load is allowed to consume more than that at its option based on other variables.
Q. So let's jump to slide 12. Did you form an opinion whether Mr. Storms communicated the inventions of the '433 patent to Mr. McNamara or Cline at Lancium?
A. Yes, sir.
Q. And what is that opinion?
A. He did not.
Q. So let's -- what's the basis for that opinion?
A. The three groups of communications that I have been given to see.
Q. And so let's turn to slide 13. And what do you intend the icons here on the left side of slide 13 to mean?
A. So the three groups of communications that I was made aware of is some oral communication to the extent that it could be understood, a group of text messages followed by one e-mail plus attachments.

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Q. And did you look at all those materials?
A. Yes, sir.
Q. And did you consider them individually?
A. I considered them individually, and I considered them collectively.
Q. So let's go to slide 18. And is this the e-mail that you looked at that contained the attachments?
A. Yes, sir.
Q. And let's go to slide 19. Actually let's just go to slide 20. So this is the -- is this the first page of the first attachment, and then second page is the colored -- color drawing?
A. This is the first page of -- one of the pages of the attachment, yes.
Q. And looking at the -- looking at this document, do you see any evidence that this data sheet teaches the system of Claim 1?
A. No, sir.
Q. Let's look at the second page of this. So Dr. Ehsani, you've been in court this whole week, haven't you?
A. Yes, I have.
Q. And you remember Mr. Storms testified about the lightening bolt here. You see the lightening bolt?
A. Yes, I do.

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Q. And if I remember right, he indicated that the little --
MR. NELSON: Can I get like a square or something around the pipe piece, or is that not possible? Not the lightening bolt, just right below it?
THE WITNESS: The T at the plumbing.
BY MR. NELSON:
Q. The T.
A. Yeah.
Q. So do you see any indication that the portion of the T that's going out to the dotted lines is electricity conductor?
A. Obviously this is not a professional means of communication. It's not a conventional means of conveying this information. Repeat your question again.
Q. That's fine. We've got -- let's talk about the dotted lines first. Leave the square up there, though.
So the dotted lines that are connected to Day-Ahead LMP for pricing node and RTMV LMP for price. Is that pricing information that's coming?
A. That is a form of pricing information with emphasis on information.
Q. Right. That's data, correct; that's not electricity?
A. That is not electricity. That is not power. That's not energy. It is information.

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Q. So the little portion off the -- the vertical portion of the pipe there under the lightening bolt, and then there's a horizontal portion that looks like the dotted lines come out of. Do you see that?
A. I do.
Q. And would a person of ordinary skill in the art looking at this drawing conclude that that little portion of that pipe was designed to be an electricity -- an electricity connection that would electricity connect this to something?
A. Again, you have to use your imagination. This is not professional symbols. But if the wind farm is somehow lightening bolt connecting to the plumbing, it must be conveying electric power to the mining bank that is shown on the bottom. So maybe we can say that the bolt of lightening is transmission of wind farm power to the mining bank.
Q. Right. But what -- what I'm talking about is the -- what I'm talking about is the horizontal line that has -- that looks like what you just testified to with data coming out of it. So right -- right here.
A. And what was the question about?
Q. Does this -- would this convey an electricity transmission to a person of skill in the art?
A. No, sir. And furthermore, the concept of mixing electricity and information in the same pipeline is a

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novelty not known in electrical engineering.
Q. So looking at this drawing just generally, looking at the bubbles up here, do you see any information that this is teaching the use of a system that must use a specified amount of power?
A. Not in the context of the patent, no, sir.
Q. And I think we talked about this. The data that's being conveyed here by these bubbles, this is just price information, right?
A. This is price information per megawatt hour, for example.
Q. Per megawatt hour. Looking at this document, do you see any evidence that the system that's described here, to give it the benefit of the doubt the simulation that's described, has any way to track the amount of power it's using?
A. Repeat the question again.
Q. Do you see any evidence that this -- the diagram teaches a way to track any amount of power that's being used?
A. If you can me to point where the consumption of electricity power is being metered or tracked, I cannot tell you.
Q. So let's go to the next page here Mr. Storms also attached a spreadsheet, did he not?

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A. That's my understanding, yes, sir.
Q. And can I get the next page, next slide, 25. And that spreadsheet had columns, right, and these are the columns up here?
A. Yes, sir.
Q. And so let's go first to the Day-Ahead LMP. Do you see that?
A. I do.
Q. That's just a price, isn't it?
A. That is price per unit of energy, megawatt hour or whatever.
Q. So Real-Time LMP, is that a price as well?
A. Correct.
Q. And Day-Ahead LMP revenue is a price?
A. Correct.
Q. Mining_rev is a price?
A. Correct.
Q. Now, this spreadsheet doesn't have any source code with it, does it? You didn't -- there's no source code shown on this spreadsheet, is there?
A. There's no source code shown on this spreadsheet whatsoever.
Q. And there's no mathematical formulas in this spreadsheet?
A. There are infinite settled mathematical formulary

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that could result in these numerical numbers. In other words, you cannot go from a solution to an equation, high school algebra. You cannot -- a solution may be the solution of infinite number of equations with different coefficients, different variables, different parameters.
So you cannot infer from a solution -- a numerical solution what equation or set of equations that resulted in those numbers are.
Q. And from what you can tell in the spreadsheet, is the decision making entity just choosing the -- the column, if you will, that gives it the higher -- among the revenue columns, is it choosing the one that just gives it the highest price?
A. Yes, this is at best a way of arriving at the highest revenue or income based on several scenarios.
Q. And do you see anything in the spreadsheet that teaches that the simulation from once it was generated would have to maintain a minimum amount of power, a specific amount of power at all?
A. No, sir.
Q. Let's go to the next slide. Does this summarize -- does this slide summarize your opinions regarding the spreadsheet?
A. Yes.
Q. So no source code, right?

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A. No source code.
Q. No mathematical formulas?
A. Yeah, no mathematical formulas that can be explicitly derived from them. No explicit logic, a combination -- our methodology, the combination of those things sometimes referred to as an algorithm that results in those numbers.
Q. No description of values or where they came from other than the column headings?
A. Correct.
Q. Okay. Can we get the next slide. So to summarize your opinion, does all the materials together that Mr. Storms provided --
THE COURT: I was going to ask a question.
MR. NELSON: I'm sorry, Your Honor.
THE COURT: So when you say hard coded, those five bullets are what you mean by hard coded?
THE WITNESS: I suppose that this means that -- it's a programming term. It means it's not changeable.
BY MR. NELSON:
Q. And the spreadsheet is like a PDF, isn't it? You -- there's -- there's no other information but what's on this sheet; is that right?
A. The spreadsheet is simply a collection of numbers which presumably are solutions to some algorithm which includes mathematics, logical flow chart, and what have you.

You cannot infer what that methodology is precisely.
THE COURT: So you're saying you can't reverse engineer to come up with the inputs for this?
THE WITNESS: You cannot work backwards and figure out how this is computed. I'll give you an example. There was a fudge factor of 1.05 that the author of the software chose to use in the calculation of these numbers. The option of even having that fudge factor and what that value is, is at the option of the programmer. It would never be discernable from these numbers.
THE COURT: Understood.
BY MR. NELSON:
Q. So let's go to the next slide, please. So is your opinion that none of Mr. Storms' documentation taught that he -- or indicated that he communicated the inventions of the '433 patent to Lancium?
A. Yes, sir.
Q. And let's go to slide 34, please -- well, actually, let's go to slide 33 -- 30 -- well, yeah, let's go to slide 33.
So did you look at Mr. Storms' other materials, his -- his different pictures, his PDU boards, his white boards, his interface?
A. I looked at all these things that were supplied to me, yes.

Q. And did you form an opinion whether Mr. Storms conceived the inventions of the '433 patent based on all the materials you looked at?
A. Yes, sir.
Q. What is that opinion?
A. Based on everything I've seen, including these photographs and figures, he did not conceive of the elements of the claims of this patent.
Q. And you didn't look at the source code yourself, did you?
A. I glanced at it, but I did not analyze it myself.
Q. And what did you rely on to form your -- did you form an opinion whether anything in the source code taught -- indicated that Mr. Storms had conceived the claims of the '433 patent?
A. Yes, sir.
Q. And what is that opinion?
A. The source code also supports my opinion that it does not conceive or anticipate or -- or exercise the elements of the patent.
Q. And you relied on Dr. Baer for that opinion -- or Mr. Baer for that opinion?
A. That is correct.
Q. Did you speak to Mr. Baer before finding that opinion -- before forming that opinion?

A. Yes, sir.
Q. Let's go back to slide 30. Did you form an opinion whether Mr. Storms communicated the dependent claims of the '433 patent to Lancium?
A. Yes, sir.
Q. And is that opinion summarized on the right side of slide 30?
A. Exactly. And referenced in my report as shown.
Q. Okay. And what is that opinion?
A. That Austin Storms did not communicate the invention of '433 patent, including its dependent claims. And these things were known to Mr. McNamara and Mr. Cline prior to Mr. Storms' communication. Or if not known, communicated -- they were not communicated by Mr. Storms to Mr. McNamara.
Q. And did you form an opinion whether Lancium independently conceived the inventions of the '433 patent?
A. Yes, sir.
MR. NELSON: And can I get slide 35.
BY MR. NELSON:
Q. And what is that opinion; is that opinion on slide 35?
A. Well, yes. Mike McNamara and Raymond Cline independently conceived of the inventions of 43 -- '433 patent without using any information provided by Mr. Austin Storms.

Q. And you've been in court all week. Have you seen anything to change that opinion?
A. No, sir.
MR. NELSON: All right, thank you.

CROSS-EXAMINATION

BY MR. LABBE:
Q. Good afternoon, Dr. Ehsani. Let's bring up TX1, figure 1.
Dr. Ehsani, you're familiar with this figure from the patent, correct?
A. I have seen it, yes.
Q. And this figure depicts an electricity grid, is that right?
A. An example of an electrical grid, yes.
Q. And the electrical grid includes generation sources, such as a windmill; is that right?
A. Yes.
Q. Let's take a look at column 1, lines 28 to 33 in the patent. Here it says: "An electrical grid includes generation stations that produce electrical power at large scales for delivery through the grid."
Do you see that?
A. I do.
Q. So the patent defines an electrical grid to include generation stations, correct?

A. That is correct.
Q. And a behind-the-meter load can be connected to the grid; is that right?
A. Not if you characterize it as behind the meter. A behind-the-meter load is connected to behind-the-meter generation.
Q. Let's take a look at figure 2, and also refer to column 7, lines 10 through 12 of the patent, which describes figure two.
Here it says: "Figure 2 shows a behind-the-meter arrangement with optional grid power, including one or more flexible datacenters according to one or more examples of embodiments."
And that's in this patent, correct?
A. I assume that's correct, yes.
Q. Let's bring up TX157.3. You testified about the figure that Mr. Storms sent to Lancium, correct?
A. I did.
Q. In your opinion, that pipe, that pipe that's shown right here, you're not quite sure what this pipe is, are you?
A. I did not say such a thing.
Q. Well, what do you think that pipe is?
A. Well, it's -- obviously, visually it's water plumbing, but I think what is meant by the artist is that it's a conduit, a conveyance method for a combination of wind farm electric power in combination with power pricing.

Q. In your expert report you say that this shows a behind-the-meter load, is that right?
A. Yes, in my report I say that it sounds like a reasonable quote.
Q. But we don't see a meter shown in any place in this graphic, do we?
A. That's not the way behind the meter is defined. You don't have to see the picture of the meter.
Q. You don't have to see the picture of the meter to know that this is a behind-the-meter load, correct?
A. This cartoon is showing a wind farm energizing a Bitcoin mining box.
Q. So it is showing the electricity flowing to the load, correct?
A. That is one interpretation of the lightening bolt.
Q. And could this juncture here be connected to the grid, Dr. Ehsani?
A. No, sir, absolutely not.
Q. And why -- and, Dr. Ehsani, we have a pipe here that's connected to the load, and a pipe here that's connected to generate money, but your opinion is that that could not possibly be the grid; is that right?
A. What you said is, with all due respect, sir, total nonsense. That is not a pipe that generates money. That's price of electricity, it's information coming in. Somebody may be answering a phone, he doesn't get energy from talking on the phone.

Q. Now, Dr. Ehsani, you understand that one of the claim elements of the claims of the '433 patent is receiving data from a power option agreement; is that right?
A. Repeat the question again.
Q. You understand that one of the claim elements in the patent is receiving data from a Power Option Agreement; is that right?
A. Correct.
Q. And you rely on information in the patent itself for your understanding of a Power Option Agreement; is that right?
A. Power Option Agreement in the context of the patent is, as defined in the patent, exemplified by its figures and construed by the Court.
Q. If we take a look at column 5, lines 45 through 47. One thing the patent says -- it was column 50, lines 45 to 47 of the patent.
One thing the patent says is: "The power generation source may benefit from the power option agreement by directing excess power to the load instead of temporarily halting power production."

Do you see that?
A. I do.
Q. A power generation source could include a wind farm, correct?
A. You do not exercise Power Option Agreement, as defined in the patent, with a wind farm. You do it with the power provided -- the grid power provider. Because it has to be curtailable --
Q. Dr. Ehsani --
A. -- on request in a granular way.
Q. My question is: A power generation source could include a wind farm, correct?
A. Connected to the grid before it arrives at the load discussed in the patent.
Q. Now, you didn't know Mr. McNamara before this case, did you?
A. No, sir.
Q. Nor Dr. Cline?
A. No, sir.
Q. And it's your opinion that Dr. Cline and Mr. McNamara had a flash of insight in about August of 2019; is that right?
A. Based on the information that I was given to analyze, it appears that the conception occurred to them.
Q. Let's look at TX --

A. Around then.
Q. Let's look at TX526. And this is the document that you cite, or one of them, in your expert report for this flash of insight; is that right?
A. I don't recall. If you represent as such, I accept your representation.
Q. Here, Mr. Cline is reporting on a call that he had with Tim Carter, do you see that?
A. I read there that "we had a call with Tim Carter."
Q. And Mr. Cline explains in the next paragraph: "An important point, which didn't come across in our conversations, is that the award is essentially an obligation on our part that we consume that amount of power that ERCOT could curtail. If we routinely use less than our award, we could suffer a penalty."
This is Mr. Cline explaining -- Dr. Cline explaining a Power Option Agreement to Mr. McNamara, correct?
A. This is part of their learning curve, yes.
Q. Reporting on his call to Tim Carter, correct?
A. Mr. Cline is writing this e-mail to Mr. McNamara, this -- analyzing this part of the Power Option Agreement, yes.
Q. It's not your opinion that Dr. Cline invented Power Option Agreements, is it?

A. Sir, Mr. Cline and Mr. McNamara invented the control of power to a datacenter based on Power Option Agreement, as they define it in their patent and is construed by the Court. It's the combination of two technologies. That is the essence of the patent.
Q. But neither of them invented Power Option Agreements, correct?
A. Power Option Agreement, as defined in the patent, is an element of the claimed inventions.
MR. LABBE: No further questions, Your Honor.

REDIRECT EXAMINATION

BY MR. NELSON:
Q. This is figure 2 that was up just a little while ago, do you see that?
A. Yes, sir.
Q. Does figure 2 show separate grid and behind-the-meter connections?
A. Separate grid?
Q. Yeah. Well, is it your opinion that figure 2 shows separate grid and separate behind the -- that the grid connections and the behind-the-meter connections are separate?
A. No, it's all an integrated grid that benefits from power from different places.
MR. NELSON: All right. No further questions.

THE COURT: Are you done with this witness?
MR. LABBE: No further questions, Your Honor, from us.
THE COURT: Okay.
Dr. Ehsani, you may step down.
Any exhibits you need to get in?
MR. NELSON: Just -- I think we admitted some -- I think it was -- I don't know what the number was, but I think we admitted it when we went. And at this time, Your Honor, before we rest, we just want to renew our Rule 52(c) motion.
THE COURT: Okay. And I'll take it under advisement.
MR. NELSON: Thank you, Your Honor.
THE COURT: All right. So we have plaintiff with 13 minutes, 41 seconds, and defendants with 20 minutes, 42 seconds for your closings, if you want to give closings.
MR. HORTON: Yes, Your Honor.
MR. LABBE: Just one housekeeping item on that -- by deposition there was an Exhibit 94 that we didn't have prepared before that we'd like to move into admission. It's TX985. This is the one that Mr. Nelson said was missing.
THE COURT: Okay. That's TX985.
MR. LABBE: TX985.

THE COURT: TX985. Move for admission.
MR. NELSON: Your Honor, at this time, could we request a 15-minute recess? I'm the person who is giving the closing, and so I would really appreciate 15 minutes to get my thoughts together.
THE COURT: That's -- we'll give you 10 minutes and that's fine. We'll take a 10-minute break, both sides can get your thoughts together. And we'll resume at 3:05.
MR. NELSON: Thank you, Your Honor. I'll use every one of them.
(Break taken.)
THE COURT: All right. You may be seated. All right. You can begin.
MR. HORTON: Your Honor, just to confirm, it was 13 minutes and 14 seconds for the plaintiff?
THE COURT: Yes, 13 minutes and 15 seconds.
MR. HORTON: Thank you, Your Honor. May it please the Court.
In the opening, we said this case Mr. Storms' innovation story. It was more than a story, it's corroborated. Both Storms and Dr. McClellan walked through that corroboration with source code files, white board notes, photographs, Power Distributions Units, and data models.
Mr. Storms' contemporaneous text messages and

e-mails confirm his thoughts and actions. For conceptions, Storms need only have a definite idea of his invention. But he had more than that, he built a simulation and it worked.

Mr. Storms was all ready working on some of the components of his system before his game-changing revelation. He already had a set of miners performing computational operations using power in a control system.

Then on April 11, 2019, Mr. Storms tells Mr. Hakes about his game-changing idea: Making money when the miners are turned off. He tells us where he's going with this as early as April 11, 2019, modeling miner profitability, which Dr. Cline confirmed with his Bitcoin price, power price, hashrate and difficulty, dynamically calculating strategies for maximizing profit at what Locational Marginal Price selling power back to the grid is more profitable than mining.

He writes his code and models the output of his system. He asks some questions about where he might pull external data and ERCOT data. He confirms his understanding of ERCOT market rules, then Storms creates his documentation describing his BearBox miner management system.

Storms' documentation shows what he already had, the miners, computational operations, power from the grid, and a control system, but now it also shows monitoring a set of conditions; Bitcoin API, which includes Bitcoin price, a

Bitcoin known hashrate, network difficulty, block height, he's monitoring the Real-Time Market pricing, the Day-Ahead Market pricing.

You can see PDX 5.4, please. With that data, Storms computes the miner breakeven values so we can determine miner profitability, columns A, B, E, G, I, and J.

Dr. Ehsani made this spreadsheet sound like it was some sort of calculus, which was interesting to me since Lancium, in its answer to our complaint, described this as trivial math calculations. So I'm not sure if this is too difficult or too easy.

Back to Mr. Storms. So he's monitoring these conditions, including the Real-Time pricing and the Day-Ahead pricing, but now he also --

PDX 5.5, please.

-- power option data, including a set of minimum power thresholds, which we know from the Court's construction may be zero as long as not all minimum power thresholds are zero.

Even in his simulation, which Mr. Baer criticized, his miners must be consuming the power required by load, 373 kilowatts, unless they are instructed to shut down, at which time they are consuming zero. So 373 or zero.

This was described in a source code at 1.3 times

272, 1.3 kilowatts times 272 miners. Mr. Baer found this difficult, and he described it as a set value, but if it was a set value, it would just be 373. Mr. Storms had in mind that this would be a changing number of miners, which is why he described it as 1.3 times 272.

In -- in his documentation teaches that, his specification specifies 272 miners relay mapped for individual control; meaning, his system could actually be instructed to be consuming power from zero to the full load of 373 kilowatts in increments of about 1.3 kilowatt per miner.

These minimum power thresholds are associated with time intervals, most prominently five-minute time intervals, though his system is capable of just about any time interval one would want.

Columns C, D, H, K and L. Storms' documents described a system that would be instructed to mine under certain conditions for at least five minutes. The miner had to consume that power during that entire five minutes, it was obligated to.

The function of the source code was called time sleeve 300, 300 seconds, five minutes. Mr. Baer took issue with that, but it's a simulation, it's mimicking the five-minute instruction interval for ERCOT. This was true of the stimulation for each and every five-minute interval

in which there was an instruction to mine.

And I want to say something else about power option data as it appears in the claims. The claim says power option data is based only in part by Power Option Agreement. Power option data is not based entirely on the Power Option Agreement, and we think that's important.

Power Option Agreement, I've got a few things to say about the Power Option Agreement limitation. As an initial matter, Mr. Storms' documentation necessarily teaches an agreement between a generator and a load. The BearBox is not getting power from the wind farm for free.

And the Court construed this term to be --

Can we see the *Markman* order, please.

The Court construed this term to be an agreement between a power entity associated with the delivery of power to a load and the load, wherein the load provides the power entity with the option the reduce the amount of power delivered to the load up to an agreed amount of power during an agreed amount -- agreed-upon time interval, such that the load must use the least the amount of power subject to the option during a time interval, unless the power entity exercises the option.

This is exactly what Mr. McCamant described as a demand response agreement. This is exactly the demand response agreement that Mr. McCamant confirmed has existed

**IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE**

BEARBOX LLC and AUSTIN STORMS, Plaintiffs, v. LANCIUM LLC, MICHAEL T. MCNAMARA, and RAYMOND E. CLINE, JR., Defendant.	)	C.A. No. 21-534-MN

**DEFENDANTS' SECOND SUPPLEMENTAL RESPONSE TO
PLAINTIFFS' INTERROGATORY NO. 3**

Pursuant to Rules 26 and 33 of the Federal Rules of Civil Procedure and the Local Rules of this Court, Defendants Lancium LLC, Michael T. McNamara, and Raymond E. Cline, Jr., (collectively, "Defendants"), by their undersigned attorneys, hereby provide the following supplemental response to Plaintiffs BearBox, LLC and Austin Storms' (collectively, "Plaintiffs") Interrogatory No. 3 served on June 9, 2021 as follows:

PRELIMINARY STATEMENT

Defendants' supplemental response to Plaintiffs' Interrogatory No. 3 is made to the best of Defendants' present knowledge, information, and belief. Defendants' investigation of the facts are ongoing, and Defendants reserve the right to supplement or amend these responses pursuant to the Federal Rules of Civil Procedure, the local rules, the Court's Default Standard for Discovery, Including Discovery of Electronically Stored Information ("ESI"), the Court's Scheduling Order (D.I. 35) and Amended Scheduling Order (D.I. 35), and any other applicable orders. Defendants' responses are not admissions, concessions, or waivers as to the existence, relevance, materiality, foundation, or admissibility of any documents or information.

TX005
BearBox v. Lancium
21-cv-00534

GENERAL OBJECTIONS

1. Defendants' responses are made to the best of their present knowledge, information, and belief. Defendants' investigation of the facts are ongoing, and Defendants reserve the right to supplement or amend the responses pursuant to the Federal Rules of Civil Procedure, the local rules, and any scheduling order entered in this case.

2. Defendants object to the Interrogatories to the extent they seek information or documents that are outside the possession, custody or control of the Defendants. Defendants further object to the definition of "Lancium," "You," and "Your" to the extent it includes "all of Lancium LLC's predecessors, predecessors-in-interest, successors, successors-in-interest, subsidiaries, parents, and affiliates, all entities acting in joint venture, licensing or partnership with one or more of the aforementioned, and all past or present directors, officers, agents, representatives, employees, consultants, attorneys, and others acting on behalf of one or more of the aforementioned." Defendants will provide discovery responses on behalf of the named Defendants that can be located upon a reasonable search and investigation proportional to the needs of the case.

3. Defendants object to the Interrogatories to the extent they seek information or documents that are not within Defendants' possession, custody, or control; to prepare information or documents that do not already exist; or to produce documents or information in a format other than that in which it is ordinarily kept by Defendants. To the extent Defendants agree to produce documents in response to any Interrogatory, it will do so (to the extent documents exist) after performing a reasonable search and investigation proportional to the needs of the case running up

to the date Plaintiffs filed its Amended Complaint. Nothing contained in any response herein shall be deemed an admission that any responsive documents exist.

4. Defendants object to the Interrogatories to the extent such Interrogatory seeks the production of information or documents protected by any right to privacy, confidentiality obligations, protective order, or other agreement or obligation not to disclose such document or information.

5. Defendants object to the Interrogatories and to the Definitions and Instructions to the extent they request emails or other electronically stored information in a manner that is inconsistent with any Electronically Stored Information ("ESI") order entered in this action. Defendants will comply with any ESI order once entered in this action.

6. Defendants object to the Interrogatories to the extent they are indeterminate with respect to time and to the extent they seek to impose unreasonable burdens on Defendants based on excessive time scope.

7. Defendants object to the Interrogatories to the extent they seek information or documents protected from discovery by any privilege or immunity, including but not limited to the attorney-client privilege, the attorney work product doctrine/immunity, the joint defense privilege, the common interest privilege or community of interest privilege, or any other applicable privilege, immunity, protection or exemption from disclosure, or information or documents otherwise protected from disclosure under the Federal Rules of Civil Procedure, the Federal Rules of Evidence, or relevant statutory or case law. Production of information or documents subject to such privilege, protection, or immunity in response to any of the Interrogatories is inadvertent and shall not constitute or be deemed to constitute a waiver of such privilege, protection, or immunity.

8. Defendants object to Definition and Instruction K ("Relate to," "Relating to," or Related to") as overly broad, unduly burdensome, and ambiguous, particularly the portions of the definition "referring directly or indirectly to, dealing with, or in any way pertaining to." Such descriptions are subjective, unhelpful, and expand the scope of discovery beyond what is appropriate in this case.

9. Nothing contained in any response herein shall be deemed to be an admission, concession, or waiver by Defendants as to the relevance, competency, materiality, foundation, or admissibility of any document or information provided in response to Plaintiffs' Requests.

10. To the extent any Interrogatory calling for "all," "each," or "every" piece of information as being overly broad and unduly burdensome. It is impossible, to represent, even after a reasonable and diligent search, that all, each, and every piece of information or document falling within a description can be or has been assembled.

RESPONSE TO INTERROGATORIES

INTERROGATORY NO. 3:

Describe in detail the development of each invention claimed in the '433 Patent including the conception, reduction to practice, and any other development activities for each claimed invention. A complete response to this Interrogatory should include an identification, on a claim-by-claim and element-by-element basis, of which of the purported inventors named on the '433 Patent conceived of the claimed inventions, reduced the claimed inventions to practice, or otherwise contributed to the development of the claimed inventions, including the dates of each of these activities and an identification of all documents or other evidence that support Your contentions.

ANSWER:

Defendants object to this Interrogatory as premature, overly broad, unduly burdensome, and not proportional to the needs to the case considering the importance of discovery in resolving the issues and whether the burden or expense of the proposed discovery outweighs its likely

benefit. In particular, Plaintiffs bear the burden of proof on their inventorship claims and per the Court's Scheduling Order, D.I. 35, "contention interrogatories, if filed, shall first be addressed by the party with the burden of proof" and "the more detail a party provides, the more detail a party shall receive," but Plaintiffs have provided only a cursory explanation of their claims. Defendants further object to this Interrogatory as seeking an identification of "all documents or other evidence that support Your contentions" because this is not proportional to the needs of the case and it is unduly burdensome, if even possible, to locate, identify, and describe every such document or piece of "evidence" within the scope of this Interrogatory. Defendants also object to this Interrogatory as irrelevant, overly broad, and unduly burdensome by requesting a detailed description of "which of the purported inventors named on the '433 Patent" conceived, reduced to practice, or otherwise contributed to the claimed inventions because Plaintiffs have not pleaded claims challenging the comparative contributions of the named inventors; Plaintiffs' claims are based only upon the non-inclusion of Austin Storms as a purported inventor of the '433 Patent. Defendants also object to this Interrogatory as irrelevant, vague, ambiguous, overly broad, and unduly burdensome by requesting a detailed description of "reduc[ing] the claimed inventions to practice" and any "contribut[ion] to the development of the claimed inventions" of the '433 Patent because inventorship is based upon contribution to conception of a claimed invention. Defendants object to the use of the term "Your" as defined by Plaintiffs, as overbroad because it includes "all of Lancium LLC's predecessors, predecessors-in-interest, successors, successors-in-interest, subsidiaries, parents, and affiliates, all entities acting in joint venture, licensing or partnership with one or more of the aforementioned, and all past or present directors, officers, agents, representatives, employees, consultants, attorneys, and others acting on behalf of one or more of the aforementioned"; Defendants provide discovery responses on

behalf of Lancium LLC and the named Defendants only. Defendants still further object to this Interrogatory to the extent it seeks information, documents, and communications protected by attorney-client privilege, work product privilege, or other privilege or immunity.

Subject to and without waiver of the foregoing objections, and based upon Defendants' investigation to date, Defendants respond as follows: Michael T. McNamara ("McNamara"), Lancium LLC's Chief Executive Officer, co-founded the company in 2017 as a technology company working to create software and intellectual property solutions that enable more renewable energy on the nation's power grid. Raymond E. Cline, Jr. ("Cline") joined Lancium LLC ("Lancium") in late 2017 as its Chief Computing Officer and currently serves as Lancium's Chief Technology Officer. Since 2017, McNamara and Cline have worked together to continue innovating in the field of data center power ramping software, including power ramping for cryptocurrency mining operations, and their work has led to numerous issued patents, including the following:

- U.S. Patent No. 10,873,211 (filed Sept. 13. 2018) "Systems and Methods for Dynamic Power Routing with Behind-the-Meter Energy Storage";
- U.S. Patent No. 10,444,818 (filed Oct. 30, 2018) "Methods and Systems for Distributed Power Control of Flexible Datacenters";
- U.S. Patent No. 10,367,353 (filed Oct. 30, 2018) "Managing Queue Distribution between Critical Datacenter and Flexible Datacenter";
- U.S. Patent No. 10,452,127 (filed Jan. 11, 2019) "Redundant Flexible Datacenter Workload Scheduling";
- U.S. Patent No. 10,618,427 (filed Oct. 8, 2019) "Behind-the-Meter Branch Loads for Electrical Vehicle Charging;
- U.S. Patent No. 10,608,433 (filed Dec. 4, 2019) "Methods and Systems for Adjusting Power Consumption Based on a Fixed-Duration Power Option Agreement";
- U.S. Patent No. 10,857,899 (filed Mar. 4, 2020) "Behind-the-Meter Branch Loads for Electrical Vehicle Charging"; and
- U.S. Patent No. 11,016,456 (filed Feb. 13, 2018) "Method and System for Dynamic Power Delivery to a Flexible Datacenter Using Unutilized Energy Sources."

As demonstrated by their documented history of innovation, McNamara and Cline's work progressively led to the conception of the inventions claimed in the '433 Patent, which occurred prior to the filing on October 28, 2019, of provisional application no. 62/927,119, to which the '433 Patent claims priority. McNamara and Cline's conception of the inventions claimed in the '433 Patent also occurred independently of and without any contribution by Austin Storms.

Discovery in this litigation is also in its early stages, and Defendants' investigation regarding the subject matter of this Interrogatory is ongoing. Accordingly, Defendants reserve the right to amend or supplement this response as additional information becomes available, including by identifying documents pursuant to Federal Rule of Civil Procedure 33(d).

FIRST SUPPLEMENTAL RESPONSE TO INTERROGATORY NO. 3:

Subject to and without waiver of the foregoing objections, Plaintiffs have, thus far, failed to meaningfully identify any element of any claim of the '433 patent that "falls within the scope of the BearBox Technology" as alleged in paragraph 4 of the Amended Complaint as requested by Defendants in, for example, Defendants' Interrogatory No. 3. Instead, Plaintiffs produced a chart that, for each claim element, simply states "Austin Storms conceived and developed technology" and then essentially parrots the language of each claim element. Plaintiffs also state they will produce documents sufficient to respond to the Interrogatory under Fed. R. Civ. P. 33(d). But Plaintiffs identify no specific documents from their production that they contend are responsive to Defendants' Interrogatory No. 3 and thus have failed to comply with Rule 33(d).

Plaintiffs also state that Mr. Storms verbally communicated information to Mr. McNamara, but provide no details regarding when those communications allegedly took place and/or the circumstances surrounding them. *See, e.g.,* Plaintiffs' Supplemental Answer to Defendants' Interrogatory No. 1. With respect to the substance of the alleged conversation(s), Plaintiffs cherry

pick certain words/phrases, identify public electrical grid operators (*e.g.,* the Electric Reliability Council of Texas ("ERCOT"), the Midcontinent Independent System Operation ("MISO"), and the Southwest Power Pool ("SPP")), and recite concepts such as it is advantageous to mine cryptocurrency when power is inexpensive as evidence that Mr. Storms allegedly told Mr. McNamara information that (1) Mr. McNamara did not already know, and (2) Mr. Storms should be a named inventor on the '433 patent. Such high-level statements, however, are not fully responsive to Defendants' Interrogatories.

It is black-letter law that a person seeking to add himself as an inventor "must meet the heavy burden of proving [his] case by clear and convincing evidence." *See Scott v. Zimmer, Inc.*, 889 F. Supp. 2d 657, 662 (D. Del. 2012). A purported inventor must show that he made a contribution to the claimed invention that is not insignificant in quality, when that contribution is measured against the dimension of the full invention, and did more than merely explain to the real 11 inventor(s) well-known concepts and/or the current state of the art. *See Acromed Corp. v. Sofamor Danek Group, Inc.*, 253 F.3d 1371, 1379 (Fed. Cir. 2001); *Scott*, 889 F. Supp. 2d at 662. A purported inventor's uncorroborated testimony, moreover, cannot, by itself, rise to the level of clear and convincing evidence. *Acromed*, 253 F.3d at 1379; *Scott*, 889 F. Supp. 2d at 663. Further, as noted above, per the Court's Scheduling Order (D.I. 35) "contention interrogatories, if filed, shall first be addressed by the party with the burden of proof" and "the more detail a party provides, the more detail a party shall receive." To date, Plaintiffs have not provided a meaningful identification of any aspects of the claimed inventions of the '433 patent that Plaintiffs allegedly shared with Mr. McNamara. Nor have Plaintiffs identified any corroboration of any alleged conversations with Mr. McNamara (or anyone else from Lancium) where such yet-to-be-identified aspects were allegedly communicated to Mr. McNamara. Defendants, therefore, continue to object

to this Interrogatory as premature, unduly burdensome, and overly broad. Once Plaintiffs identify with particularity the elements of the '433 patent's claims for which Mr. Storms maintains he provided Mr. McNamara information (*e.g.*, identify the specific details of the alleged BearBox technology Plaintiffs contend are covered by the claims of the '433 patent that Mr. Storms purportedly shared with Mr. McNamara, and provide corroboration for each such identification), Defendants will further supplement this Response.

Notwithstanding the foregoing, and reserving all objections and reserving the right to further supplement as Defendants' investigation continues and if/when Plaintiffs fully respond to Defendants Interrogatories as discussed above, Defendants further respond that Lancium, Mr. McNamara, and Dr. Cline have been continuously developing their technology and intellectual property since at least 2017. By no later than April 2019, Messrs. McNamara and Cline were aware of Loads as a Resource ("LAAR") and programs associated therewith, including, for example, utilizing software to turn cryptocurrency miners on and off in response to the price/demand for electricity. By no later than April of 2019, Messrs. McNamara and Cline had conceived of and reduced to practice technology capable of dynamic power delivery to flexible datacenters, including the ability to ramp up and down one or more computing systems (*i.e.*, to instruct cryptocurrency miners, for example, to mine or not to mine under certain conditions). Certain aspects of this technology are described in PCT Publication Number WO 2019/139632 A1 (the "'632 application"), LANCIUM00000050-93, which is a publication from an application filed on February 13, 2018 that eventually issued as U.S. Patent No. 11,016,456. *See also, e.g.,* LANCIUM00014483, LANCIUM00014493, LANCIUM00014517, LANCIUM00014524, LANCIUM00014533, LANCIUM00014534, LANCIUM00014543, LANCIUM00014552, LANCIUM00014559, LANCIUM00014579, LANCIUM00014586, LANCIUM00014595,

LANCIUM00014603, LANCIUM00014612, LANCIUM00014619, LANCIUM00014628, LANCIUM00014653, LANCIUM00014662, LANCIUM00014671, LANCIUM00014672, LANCIUM00014701, LANCIUM00014702, LANCIUM00014732, LANCIUM00014733, LANCIUM00014764, LANCIUM00014825, LANCIUM00014832, LANCIUM00014841, LANCIUM00014844, LANCIUM00014864, LANCIUM00015026, LANCIUM00015027, LANCIUM00015046, LANCIUM00015048, LANCIUM00015108, LANCIUM00015109, LANCIUM00015128, LANCIUM00015129, LANCIUM00015148, LANCIUM00015150, LANCIUM00015154, LANCIUM00015169, LANCIUM00015170, LANCIUM00015238, LANCIUM00015241, LANCIUM00015260, LANCIUM00015339, LANCIUM00015452, LANCIUM00015456, LANCIUM00015503, LANCIUM00015595, LANCIUM00015604, LANCIUM00015717, LANCIUM00015798, LANCIUM00015911, LANCIUM00015912, LANCIUM00015931, LANCIUM00015932, LANCIUM00015982, LANCIUM00015989, LANCIUM00015998, LANCIUM00015999, LANCIUM00016051, LANCIUM00016055, LANCIUM00016069, LANCIUM00016072, LANCIUM00016086, LANCIUM00016088, LANCIUM00016102, LANCIUM00016105, LANCIUM00016119, LANCIUM00016121, LANCIUM00016135, LANCIUM00016136, LANCIUM00016168, LANCIUM00016169, LANCIUM00016201, LANCIUM00016204, LANCIUM00016218, LANCIUM00016219, LANCIUM00016228, LANCIUM00016229, LANCIUM00016241, LANCIUM00016256, LANCIUM00016257, LANCIUM00016260, LANCIUM00016261, LANCIUM00016264, LANCIUM00016267, LANCIUM00016268, LANCIUM00016292, LANCIUM00016316, LANCIUM00016317, LANCIUM00016341, LANCIUM00016342, LANCIUM00016366, LANCIUM00016368, LANCIUM00016436, LANCIUM00016437, LANCIUM00016448.

Defendants further state that by no later than April 2019, Messrs. McNamara and Cline were aware of market pricing and market structure for wholesale electricity pricing, the relationship between Qualified Scheduling Entities ("QSEs") and Independent System Operators such as ERCOT, including that a Load Resource must register with ERCOT as a Resource Entity and be represented in the ERCOT markets by a QSE. *See, e.g.*, www.ercot.com/services/programs/load/laar/index.html, LANCIUM00014480, LANCIUM00016267, LANCIUM00016292, LANCIUM00016316, LANCIUM00016317, LANCIUM00016341, LANCIUM00016342, LANCIUM00016436, LANCIUM00016437, LANCIUM00016436, LANCIUM00016448. In addition, by no later than April 2019, Messrs. McNamara and Cline were aware of real-time pricing for electricity, the functions and interactions of QSEs with ERCOT, the use of cryptocurrency miners as a Load for qualification as a Load Resource, and that to qualify as a Load Resource required the ability to change a load in response to an instruction to meet certain performance requirements. *See* www.ercot.com/services/programs/load/laar/index.html. Additionally, by no later than April 2019, Messrs. McNamara and Cline were aware that cryptocurrency could be mined, that hash rates could be calculated for such mining, that cryptocurrency could be traded, that there was realtime information available on the price of cryptocurrency in dollars, and that this information could be utilized in conjunction with information regarding the price and/or projected price of electricity in determining when to mine or not to mine cryptocurrency. *See, e.g.*, LANCIUM00014483, LANCIUM00014493, LANCIUM00014517, LANCIUM00014524, LANCIUM00014533, LANCIUM00014534, LANCIUM00014543, LANCIUM00014552, LANCIUM00014559, LANCIUM00014579, LANCIUM00014586, LANCIUM00014595, LANCIUM00014603, LANCIUM00014612, LANCIUM00014619, LANCIUM00014628,

LANCIUM00014653, LANCIUM00014662, LANCIUM00014671, LANCIUM00014672, LANCIUM00014701, LANCIUM00014702, LANCIUM00014732, LANCIUM00014733, LANCIUM00014764, LANCIUM00014825, LANCIUM00014832, LANCIUM00014841, LANCIUM00014844, LANCIUM00014864, LANCIUM00015026, LANCIUM00015027, LANCIUM00015046, LANCIUM00015048, LANCIUM00015108, LANCIUM00015109, LANCIUM00015128, LANCIUM00015129, LANCIUM00015148, LANCIUM00015150, LANCIUM00015154, LANCIUM00015169, LANCIUM00015170, LANCIUM00015238, LANCIUM00015241, LANCIUM00015260, LANCIUM00015339, LANCIUM00015452, LANCIUM00015456 LANCIUM00015503, LANCIUM00015595, LANCIUM00015604, LANCIUM00015717, LANCIUM00015798, LANCIUM00015911, LANCIUM00015912, LANCIUM00015931, LANCIUM00015932, LANCIUM00015982, LANCIUM00015989, LANCIUM00015998, LANCIUM00015999, LANCIUM00016051, LANCIUM00016055, LANCIUM00016069, LANCIUM00016072, LANCIUM00016086, LANCIUM00016088, LANCIUM00016102, LANCIUM00016105, LANCIUM00016119, LANCIUM00016121, LANCIUM00016135, LANCIUM00016136, LANCIUM00016168, LANCIUM00016169, LANCIUM00016201, LANCIUM00016204, LANCIUM00016218, LANCIUM00016219, LANCIUM00016228, LANCIUM00016229, LANCIUM00016241, LANCIUM00016256, LANCIUM00016257, LANCIUM00016260, LANCIUM00016261, LANCIUM00016264, LANCIUM00016267, LANCIUM00016268, LANCIUM00016292, LANCIUM00016316, LANCIUM00016317, LANCIUM00016341, LANCIUM00016342, LANCIUM00016366, LANCIUM00016368, LANCIUM00016436, LANCIUM00016437, LANCIUM00016448.

Defendants further state that many (and potentially all) of the elements of each of the claims of the '433 patent had been conceived by no later than April 2019, but they are still investigating

the exact date(s) and circumstances of conception of each of these elements. Similarly, Defendants are still investigating the exact date(s) and circumstances regarding reduction to practice of each specific claim element of the '433 patent, but state that each of the claimed inventions in the '433 patent were reduced to practice by no later than October 28, 2019, the date Provisional Application No. 62/927,119 was filed with the United States Patent and Trademark Office.

Pursuant to Fed. R. Civ. Prod. 33(d), Defendants have produced and will be producing documents further evidencing conception and reduction to practice of the inventions claimed in the '433 patents. Defendants will further supplement this response identifying conception/reduction to practice related documents with particularity (*e.g.*, by Bates number).

SECOND SUPPLEMENTAL RESPONSE TO INTERROGATORY NO. 3:

Subject to and without waiving the foregoing General and Specific Objections, and incorporating by reference the above answer and supplemental answer to this Interrogatory, Defendants further object to this Interrogatory to the extend it seeks information after October 28, 2019—the date Provisional App. No. 62/927,119 (the provisional from which the '433 Patent claims priority) was filed. Nonetheless, Defendants provide a response through December 4, 2019—the date U.S. Application No. 16/702,931 (the application resulting in the '433 Patent) was filed. Defendants further state that the development of the inventions that became the '433 Patent resulted from Lancium's long history and deep experience relating to controlling electrical loads, which is further explained below to provide additional context for the inventions that became the '433 Patent. As is set forth below, certain of the claim limitations (*e.g.* "set of computing system, wherein the set of computing systems is configured to perform computational operations using

power from a grid," "monitoring a set of conditions," "a remote master control system positioned remotely form the set of computing systems," "the remote master controls system is a mobile computing device," "the set of conditions monitored by the control system comprises a price of power from the power grid and a global mining hash rate and a price for cryptocurrency," and "identifying information about the set of computing systems"), standing alone, were conceived and/or reduced to practice in 2018 and early-to-mid 2019, whereas it is presently understood that other limitations (*e.g.*, those limitations relating to "power option agreements," "power option data," "responsive to receiving the power option data, determining a performance strategy …"), and/or combinations of the limitations were conceived and reduced to practice between approximately August 2019 and October 2019. A historical timeline is reproduced below with reference to exemplary documents. Defendants further state that their investigation into the conception and reduction of the inventions of the '433 Patent remains ongoing and, accordingly, reserve their right to further supplement their Answer if additional information is obtained.

As set forth above, Lancium was founded in 2017 to, among other things, create software and intellectual property solutions that enable more renewable energy on the nation's power grid. Lancium began to fulfill this purpose almost immediately. For example, by at least November 2017, Lancium had been recognized as "developing deployable/dispatchable load products that both take advantage of negative prices and can be demand response resources and curtail under negative pricing." *See*, *e.g.*, LANCIUM00025159. Lancium recognized, at this time and continuing into 2018, that power grids suffered from selective excessive power and heavy ramping needs, which contributed to instability and volatility of the grids. Lancium also recognized that large loads, for example, industrial users, could not absorb and drop very large loads quickly. Lancium responded by developing flexible datacenters and technology permitting their flexible

datacenters to act as large-scale participating rampable loads, including using excess power for mining cryptocurrency and considering load response requirements. Lancium would install flexible datacenters that could operate intermittently and absorb or drop load nearly instantly, thus solving the slow ramping problem of large loads. These flexible datacenters could take advantage of changes in power pricing by utilizing power during periods of negative/low power prices (*e.g.*, using excess power for mining cryptocurrency) and/or by selectively running older generation mining equipment. The flexible datacenters could sit on the grid (*e.g.*, as a participating load for an Independent System Operator and/or for HVAC) or behind the fence (*i.e.*, behind the meter). Lancium also recognized the need to protect their innovative approach to grid stability and renewable energy growth through patent protection. *See*, *e.g.*, LANCIUM00025166, LANCIUM00028002, LANCIUM00016437, LANCIUM00016448, LANCIUM00027639.

Throughout 2018, Lancium continued development of its flexible datacenters (which they also called rampable datacenters) with a focus on wind power as the renewable energy source. During this period, Lancium reviewed historical power pricing and considered power price in their datacenter power utilization decisions, and other conditions such as the projected hashrate of the rampable datacenters and the global hashrate. *See*, *e.g.*, LANCIUM00020038, LANCIUM00028284, LANCIUM00030255. For example, by at least February 2018, Lancium had developed proposals for wind farm installation of their flexible/rampable datacenters, including transformer connections, auxiliary support power, modular datacenters, metering, internet connectivity, supervisory control and data acquisition ("SCADA") control systems, load break switches, and low-voltage distribution power modules for the datacenters. *See*, *e.g.*, LANCIUM00027779, LANCIUM00027787, LANCIUM00027788. Lancium also educated itself on the energy market and necessary regulatory requirements, and developed strategies for

integrating its rampable datacenter within the regulatory requirements of power markets, including installation of interruptible loads, installation of behind-the-meter loads, power purchasing and scheduling directly or through intermediaries (*e.g.*, NYPSC certified ESCO; ERCOT Load Serving Entity). *See*, *e.g.*, LANCIUM00019986. At this time, Lancium was also working on developing frequency response functionality, including consideration of battery storage systems participating in demand response and frequency response. LANCIUM00033410, LANCIUM00018285.

By no later than March 2018, Lancium was designing the computing system arrangements for their rampable datacenters, including considerations of networking, internet connectivity, and remote monitoring. *See*, *e.g.*, LANCIUM00024942. Lancium, by this time, had conceived of the ability to ramp the flexible datacenters to absorb and drop power within 5 minute windows. Lancium's further had conceived that its flexible datacenters would be operated remotely via a Network Operations Center ("NOC") and could respond to signals from grid operators (*e.g.*, an ISO) and/or from a power generator. Lancium's also had conceived using NOC software to control their flexible datacenters with fast ramping capability using both manual and automatic control to place the flexible datacenters into various power consumption states, while also considering location, power pricing, and utilization. LANCIUM00027983. Also, at least as of this time, Lancium was aware of real-time energy pricing and ancillary services (*e.g.*, Reg-Up, Reg-Down, Responsive Reserve Service, and Non-Spin). *See*, *e.g.*, LANCIUM00018226, LANCIUM00018247.

By no later than April 2018, Lancium had conceived of flexible datacenter loads in the 1MW to 100MW+ range with the ability to ramp within seconds. For example, Lancium conceived of software with the ability for: (i) remote monitoring, where wind site deployments were centrally monitored from the Lancium NOC; (ii) configurable algorithms that allowed for the

shifting of power to hardware / applications that would earn the highest margin for a given MW at a given point in time; (iii) real-time price telemetry where data feeds from grid operators, meteorological services and wind customers allowed for rapid load response by Lancium's flexible datacenters; and (iv) reporting, where Lancium's hosting customers could access a wealth of information on equipment performance and uptime. *See*, *e.g.*, LANCIUM00016268. Lancium also began discussions with a contractor (TAS) to build their modular flexible datacenter containers, which would include smart breakers. *See*, *e.g.*, LANCIUM00024923.

During May 2018, Lancium continued to iterate Lancium's flexible datacenter containers. Also, on May 1, 2018, Lancium registered as an Independent Market Information System Registered Entity in ERCOT. *See*, *e.g.*, LANCIUM00034972. In June 2018, Lancium continued work on fast power ramping, with a focus on increasing the speed at which Lancium could ramp up power consumption by the miners. *See*, *e.g.*, LANCIUM00015160. And, by no later than July 2018, under the control of Lancium's proprietary software solution, Lancium flexible datacenters could ramp or shed 80% of their load in under two minutes with the balance managed in under five minutes. *See*, *e.g.*, LANCIUM00033404. As of this time, GlidePath had sent Lancium wind site power production history so that Lancium could begin a financial analysis for installing Lancium flexible datacenters at GlidePath wind farms. *See*, *e.g.*, LANCIUM00030319, LANCIUM00030321.

By no later than August 2018, Lancium had contracted with third parties to manage buildout of flexible datacenter installation projects, including the McAdoo wind farm site and the Lancium Thomas Road R&D center. Additionally, Lancium had engaged another contractor (JVD) to iterate and build their modular flexible datacenter containers. *See*, *e.g.*, LANCIUM00016854. Lancium was also making arrangements for a demonstration of their

technology, including: issuing instructions to miners; simulated remote control of multiple flexible datacenter sites; simulated software presentation of current power pricing, miner availability, miner activity status, historical hashing performance, historical power cost, and historical economic outcome; a flexible datacenter container demonstration unit; and load ramping based on changes in power price and changes in power generation. *See*, *e.g.*, LANCIUM00015148. And, by at least September 2018, Lancium was in talks with multiple power entities for installation of the Lancium flexible datacenters at power entity wind farm sites. The first flexible datacenter container (built by JVD in accordance with Lancium's design) was delivered, energized, and operational, and Lancium also continued development and design specifications on iterations of its container design. Lancium's NOC buildout was nearly complete and the proprietary Lancium software for remotely controlling the flexible datacenters was operational. Lancium had successfully ramped miners in a full power cycle in under 5 minutes, with ramp down in under 2 minutes and ramp up in under 4 minutes. *See*, *e.g.*, LANCIUM00014628.

At least as early as October 2018, Lancium continued to investigate Load Serving Entities and External Load Serving Entities in ERCOT. *See*, *e.g.*, LANCIUM00034154. Lancium also continued to iterate multiple flexible datacenter container designs, as well as SCADA, PLC, and instrumentation architecture designs for containers and site buildings. LANCIUM00025026. Lancium also had conceived of an electro-mechanical switching control with load ramping based on requirements received from the grid manager, as opposed to simply the price of power. Such functionality included: receiving instruction from the grid manager to change power, determining how to change the power, determining the rate/period of power change, communicating the change (*e.g.*, via an instruction), causing the miners to ramp up or down, and confirming the outcome. *See*, *e.g.*, LANCIUM00025024. Lancium also continued to develop its control software functionality,

which included consideration of conditions such as: power (LMP) price, Lancium hashrate, network hashrate, Bitcoin price, grid load forecast and other grid statistics, power availability, and miner states/statuses. *See*, *e.g.*, LANCIUM00018261. Lancium also continued to innovate its software-controlled fast ramping (*e.g.*, PAR4 testing of ramping speed; replacing shell scripts with broadcast mechanism for faster on/off capabilities; miner frequency control; miner mode (state) control; performance strategy determination to meet load; and other control, alert, and reporting functions), overall system design, and high-heat tolerance modular containers. *See*, *e.g.*, LANCIUM00016219, LANCIUM00025030, LANCIUM00024898, LANCIUM00024896. In fact, as of October 2018, Lancium had invested over $770,000 in R&D infrastructure at its Houston facility, over $165,000 for designing is first modular container, and over $100,000 on developing its software, with an anticipated further spend of $340,000 on software development in the next two months. LANCIUM00021489. Also, around this time, Lancium had filed numerous patent applications covering Lancium innovation (*see*, *e.g.*, LANCIUM00020935), including WO 2019/139632 ("the '632 Application)).

By at least November 2018, Lancium had introduced ERCOT to its technology for ramping datacenters and its positive potential impact on grid stability and renewable energy generation. *See*, *e.g.*, LANCIUM00034153, LANCIUM00034099, LANCIUM00034224. Lancium also continued its iterations of container design and site design for customer site installation (*see*, *e.g.*, LANCIUM00024992), and completed an analysis of integrating its flexible datacenter technology at GlidePath's windfarm site using the SPSHANSFORDUNEXELON4_WIND_RA EXELON4 LMP node for power pricing. *See*, *e.g.*, LANCIUM00018299. In addition, Lancium was developing performance strategies to hit a target load (*e.g.*, Lancium continued to innovate its software-controlled fast ramping (*e.g.*, 90 second ramp up; communications between box control

and NOC control; miner operational state considerations; Lancium algorithms and PID calculations for performance strategy to meet load; data reporting and structures; logging; databases for status and metrics; performance strategy analytics and AI; operational modes; price data requests), overall system design, and high-heat tolerance modular containers). *See*, *e.g.*, LANCIUM00024888, LANCIUM00024886, LANCIUM00021635, LANCIUM00024878, LANCIUM00024875, LANCIUM00024877, LANCIUM00024872, LANCIUM00024874.

In December 2018, Lancium provided a term sheet to GlidePath to construct and operate its flexible datacenters at a GlidePath windfarm site with automatic curtailment of power delivery to the flexible datacenters when LMP power pricing exceeds a threshold value. *See*, *e.g.*, LANCIUM00018254, LANCIUM00018255. Lancium also continued to innovate its software-controlled fast ramping (*e.g.*, preparing control narrative; site SCADA design; container SCADA design; PLC design; receiving maximum load setpoint from site generator; internal processes and algorithms for performance strategies to manage sub-module activity to maintain site load below maximum load setpoint; simultaneous local and remote control), overall system design (e.g., power transmission; site installation designs; power skids; full and partial load shedding within specified time intervals), and high-heat tolerance modular containers (e.g., container design, cooling; fire suppression, power bar design, safety, increasing miner density; sensors; high temperature operation testing of miners). *See*, *e.g.*, LANCIUM00025008, LANCIUM00015260, LANCIUM00015265, LANCIUM00015304, LANCIUM00015330, LANCIUM00015339, LANCIUM00015451, LANCIUM00024984, LANCIUM00024976.

Lancium continued to innovate in 2019. For example, at least by January 2019, Lancium continued to innovate its software-controlled fast ramping (*e.g.*, preparing control narrative; communication links between Lancium SCADA and power provider SCADA; metered load

reading; other load readings; remote management of computational processing within each distributed computing module to control the amount of power consumed by sub-module equipment within the module; local module control of breakers; power provider control of main breaker; site control PLC automatic monitoring of hard load limit and directing responsive breaker opening when threshold is exceeded; automatically determining and executing a performance strategy for reducing load when the load limit is exceeded, including by managing computational processing (*i.e.*, a performance strategy for staying below a target load)), overall system design (*e.g.*, power skids), and high-heat tolerance modular containers (*e.g.*, cooling). *See*, *e.g.*, LANCIUM00024976, LANCIUM00024964, LANCIUM00026194, LANCIUM00015129, LANCIUM00025034.

By at least February 2019, Lancium provided details about its innovative, interruptible, responsive load technology to ERCOT for a specific site. *See*, *e.g.*, LANCIUM00030411, LANCIUM00030412. Lancium also continued to innovate its software-controlled fast ramping (*e.g.*, updating control narrative; miner firmware improvement for faster ramping; software and firmware for more granular power control of ASICs, hashcards and servers; improved frequency control of individual ASICs, hash cards and servers to better optimize power control), overall system design (*e.g.*, power skids; site network and PLC specifications), and high-heat tolerance modular containers (*e.g.*, fan motor control; power bars; improved density of packaging configurations for ASICs, hashcards and servers; constructability review of multiple current container design concepts). LANCIUM00024952, LANCIUM00026181, LANCIUM00024916, LANCIUM00024918, LANCIUM00024946. By the end of February 2019, Lancium had preliminary discussions regarding installation of the Lancium flexible datacenters with owners/developers of at least 15 energy provider projects. *See*, *e.g.*, LANCIUM00014929.

In March 2019, Lancium continued to innovate its software-controlled fast ramping (*e.g.*, testing modified firmware to enable lower power modes and more granular control; coordinated load management; site-wide load management; SCADA communications for real time and historical power utilization; soft load control to manage electrical load utilization to desired or permissible levels; hard load control for main breaker trip; automated control system for coordinated load management based on signals received from the power provider, wherein the power provider can update specific control system signals which are passed via secure communications link, received by the Lancium site controller and evaluated to trigger automated actions to manage site load; receiving load limit setpoints and compliance period signals and determining a performance strategy to meet the setpoint within the compliance period, including through the automated management of computational activity and/or breaker trip), overall system design (*e.g.*, power skids; site network and PLC specifications, site PLC design including receipt of control/status signals from power provider, communication of load limits, main breaker management, local and remote control via SCADA system; python code for reading module PLCs; meter data communications), and high-heat tolerance modular containers (*e.g.*, electrical module design and module control drawings are submitted for procurement; evolving structural designs; fan control design; sensor design). *See*, *e.g.*, LANCIUM00026158, LANCIUM00015068, LANCIUM00024571, LANCIUM00024608. Thus, by March 2019, Lancium had conceived of, receiving signals, responsively determining a performance strategy, and then, in response to a lowered setpoint signal, reducing load below a threshold within a certain compliance time period, or, in response to a raised setpoint signal, determining a performance strategy and raising the load to just below the threshold. Lancium was also iterating communications strategies at this time. *See, e.g.,* LANCIUM00024426; *see also* LANCIUM00024428, LANCIUM00024608,

LANCIUM00026145, LANCIUM00024571, LANCIUM00024475, LANCIUM00025888, LANCIUM00025848. Lancium also continued to progress towards commercial deployment during this period as evidenced by its provision of term sheets to GlidePath for sale of flexible datacenter containers and for hosting. *See*, *e.g.*, LANCIUM00018264.

In April 2019, and perhaps earlier, Lancium participated in meetings with ERCOT and a Lancium wind farm partner to address questions about how to meter Lancium's innovative technology at a power generation site. *See*, *e.g.*, LANCIUM00033839. Thereafter, because Lancium was "working on unique solutions that do not neatly conform to established utility regulations and operating protocols," Lancium requested ERCOT's assistance in navigating certain ERCOT regulations and ERCOT support granting exemptions and drafting rule/protocol changes to supersede exemptions in order to implement Lancium's technology. *See*, *e.g.*, LANCIUM00033804, LANCIUM00033810. Lancium, continued to innovate its software-controlled fast ramping (*e.g.*, Lancium "Brain" as NOC control; coordinated load management; further development of strategies for automated load decrease and increase; iterating performance strategies for obtaining/using LMP), overall system design (*e.g.*, module and site PLC design, including removing module PLCs in favor of site PLC and/or NOC control; NOC communications; power skids; I/O configurations and interoperability; direction of module-level equipment response in relation to site-wide load management requirements; development of in-house NOC-based IT solutions for SCADA functionality instead of third-party SCADA software), and iterations of its high-heat tolerance modular containers (e.g., new rack designs; power distribution; multiple vendors still under consideration for multiple container designs; module I/O configurations; fire suppression, sensors; PLC conversion to Lancium Brain; new fabrication drawings). *See*, *e.g.*, LANCIUM00024423, LANCIUM00026635, LANCIUM00025780,

LANCIUM00026294, LANCIUM00024914, LANCIUM00019586, LANCIUM00024891, LANCIUM00026218, LANCIUM00026222, LANCIUM00024363, LANCIUM00026203, LANCIUM00033479, LANCIUM00030608. Lancium also continued site design discussions with GlidePath. *See*, *e.g.*, LANCIUM00023786, LANCIUM00019586. Lancium also continued to invest in R&D and file patent applications to protect its inventions. *See*, *e.g.*, LANCIUM00033518, LANCIUM00033519.

By at least May 2019, ERCOT recognized that Lancium's behind-the-meter technology is "not a typical configuration" and "created a need for metering data to support multiple processes" (*e.g.*, a new means of metering). *See*, *e.g.*, LANCIUM00033802. During this time, Lancium continued working with stakeholders and developing the integration of its flexible datacenter technology with grid operators and power generators. *See*, *e.g.*, LANCIUM00033804, LANCIUM00033802, LANCIUM00035092. And Lancium discussed with various third parties Lancium's fast ramping technology in conjunction with behind-the-meter connections, ERCOT's ERS program, and deployment of Lancium's technology as an ERCOT Load Resource. *See*, *e.g.*, LANCIUM00035304 (attachment NDA); LANCIUM00035266; LANCIUM00035267; LANCIUM00033799, LANCIUM00033753, LANCIUM00033754. Lancium also retained a power consultant and continued to integrate its flexible datacenters into demand response programs, including the process of qualifying its load-ramping technology as an ERS participant and as a Load Resource (requiring day-ahead power bids, instantaneous curtailment, registration as a Resource within ERCOT, 2-second demand data metering, and employment of under-frequency relay control), interacting with a QSE and integration of grid frequency response technology. *See*, *e.g.*, LANCIUM00026299, LANCIUM00026300, LANCIUM00035204, LANCIUM00035218, LANCIUM00035206, LANCIUM00035210, LANCIUM00035217,

LANCIUM00035195, LANCIUM00035161, LANCIUM00035156, LANCIUM00035123, LANCIUM00035109, LANCIUM00035104, LANCIUM00035103, LANCIUM00030681, LANCIUM00030682. Also, in May 2019, Lancium continued to innovate its software-controlled fast ramping (*e.g.*, advancing site-wide coordination of load management actions by Lancium Brain, including receipt of control/status signals from a power provider and real-time site power utilization in order to trigger automated actions; automated control logic for determining performance strategies; automated opening and closing of individual module breakers; performance strategies employing software instructions to adjust computational activity for each computing rack across a site thereby managing total electrical load utilization to desired or permissible levels; employment of miner idle state to permit fast load ramp up; triggering hard load control when site load is greater than internal load limit by more than a configurable threshold or for longer than a configurable threshold value; setting internal load limits to communicated load limit setpoints within a communicated compliance period; flexible clocking ability), overall system design (*e.g.*, consideration of site I/O aggregator to replace control-logic PLCs; updated power skid quotes; new 35kV interconnection skid concepts; control and communications schema), and high-heat tolerance modular containers (*e.g.*, automated fan response, including when load limiting is active; removal of module PLCs in favor of remote-only management by Lancium Brain; consideration of module I/O aggregator to replace control-logic PLCs; revision of module design due to miner shelf redesign; submission of design changes to JVD). *See*, *e.g.*, LANCIUM00024314, LANCIUM00021740, LANCIUM00025690, LANCIUM00026321, LANCIUM00024228, LANCIUM00024229, LANCIUM00024223, LANCIUM00024225, LANCIUM00016897, LANCIUM00033268, LANCIUM00025697, LANCIUM00025691.

Lancium also continued development of a high-level draft Operational Controls Overview for a specific windfarm site within ERCOT in May 2019. The Overview provided a description of Lancium load ramping technology specific to the wind farm site. Level of power delivery, power consumption, and rate of power change would be managed by a collaborative daily/hourly communication process between Lancium and the power provider and supported by pre-arranged mutual operational planning. Lancium described control methodologies for its operation of miners in flexible datacenters, where Lancium controlled the miners as individual devices and groups of devices, and large groups of miners were installed in multiple prefabricated flexible datacenters identified as Distributed Compute Modules (DCM). The operations were served by main site power and auxiliary power (*e.g.*, behind-the-meter and grid power). Ramp time was targeted at less than 15 seconds for HASH-to-STANDBY (*i.e.*, ramp load down) and less than 30 seconds for STANDBY-to-HASH (*i.e.*, ramp load up). Lancium employed miner hash rate control as one means of varying load during HASH. The Lancium Brain used performance strategies to automatically control power consumption based on Locational Marginal Price) ("LMP"), among other signals, *See*, *e.g.*, LANCIUM00014475, LANCIUM00033777, LANCIUM00033755, LANCIUM00033758. And Lancium continued discussions with GlidePath for operation of a third-party datacenter container at a GlidePath site served by Lancium power skids and under Lancium Brain control. *See*, *e.g.*, LANCIUM00019783, LANCIUM00019785. Lancium offered to show GlidePath Lancium's R&D center with 2MW of compute power and to provide a demonstration of Lancium's load ramping technology. *See*, *e.g.*, LANCIUM00018274.

By at least June 2019, Lancium was continuing to work towards integrating its fast ramping technology into ERCOT's ERS program, including efforts to qualify Lancium's R&D center as a Load Resource, efforts to qualify a Lancium wind farm site for ERS, and continued discussions

with its power consultant and a QSE about applying Lancium's technology towards demand response, Load Resource, and ERS opportunities. *See*, *e.g.*, LANCIUM00035072, LANCIUM00035008, LANCIUM00035017, LANCIUM00035019, LANCIUM00035001, LANCIUM00035011, LANCIUM00035012, LANCIUM00035010, LANCIUM00035009, LANCIUM00034665, LANCIUM00034668, LANCIUM00034649, LANCIUM00034646, LANCIUM00034644, LANCIUM00034645, LANCIUM00034647, LANCIUM00034648, LANCIUM00034608, LANCIUM00034609, LANCIUM00034679, LANCIUM00034678, LANCIUM00034682, LANCIUM00034683, LANCIUM00024125, LANCIUM00024126, LANCIUM00024127, LANCIUM00024128, LANCIUM00033069, LANCIUM00033072, LANCIUM00033071, LANCIUM00033070, LANCIUM00033073, LANCIUM00034680, LANCIUM00033066, LANCIUM00033068, LANCIUM00034750, LANCIUM00034743, LANCIUM00034744. Lancium also continued to innovate its software-controlled fast ramping (*e.g.*, miner power management, automation, monitoring and control, including miner frequency control, very rapidly and automatically spinning cryptocurrency servers up and down based on power availability and price, optimizing individual miner frequency based on power conditions, and monitoring power price, BTC price, hashrate, and miner state; Lancium Fit product branding), overall system design (*e.g.*, always-on power connections and infrastructure; removing controls from module PLC in favor of centralized control; power skid design iterations; site controller and network design; site design; iterations of control narrative / functional description), and iterations of its high-heat tolerance modular containers (*e.g.*, cooling control; increased power capacity per container (3.9MW); power channel design). *See*, *e.g.*, LANCIUM00034656, LANCIUM00034659, LANCIUM00025603, LANCIUM00025578, LANCIUM00025588, LANCIUM00025600, LANCIUM00025598, LANCIUM00025591, LANCIUM00021666,

LANCIUM00027515, LANCIUM00027643, LANCIUM00027735, LANCIUM00025573, LANCIUM00025576, LANCIUM00025565, LANCIUM00025550, LANCIUM00025555, LANCIUM00025537, LANCIUM00025541, LANCIUM00025546, LANCIUM00033266, LANCIUM00024188, LANCIUM00024190, LANCIUM00024217, LANCIUM00024218. Additionally, Lancium worked with stakeholders to develop and advance regulatory and protocol exemptions and changes that would be necessary to integrate its fast-ramping load technology into the ERCOT power grid. *See*, *e.g.*, LANCIUM00034643, LANCIUM00034607, LANCIUM00034601, LANCIUM00034603, LANCIUM00034604, LANCIUM00034684.

In July 2019, Lancium continued working towards integrating its fast ramping technology into ERCOT's ERS program, including efforts to qualify Lancium's R&D center as a Load Resource, and continued discussions with its power consultant and a QSE about applying Lancium's technology towards demand response, Load Resource, and ERS opportunities. *See*, *e.g.*, LANCIUM00030572, LANCIUM00030573, LANCIUM00030616, LANCIUM00030620, LANCIUM00030631, LANCIUM00034726, LANCIUM00030454, LANCIUM00030457, LANCIUM00034736, LANCIUM00030527, LANCIUM00030529, LANCIUM00030596, LANCIUM00033261, LANCIUM00033264, LANCIUM00033265, LANCIUM00025624, LANCIUM00030835. Lancium also continued to innovate its software-controlled fast ramping (*e.g.*, consideration of a new hashrate metric), overall system design (*e.g.*, site layouts; network designs; power system modeling; utility application), and iterations of its high-heat tolerance modular containers (e.g., revisions related to new V-box design; power channel design; power density calculations and alternate equipment density; analysis of various I/O aggregator options; fabrication decisions). *See*, e.g., LANCIUM00025668, LANCIUM00025675, LANCIUM00025677, LANCIUM00025680, LANCIUM00025685, LANCIUM00025628,

LANCIUM00025635, LANCIUM00025639, LANCIUM00027799. Additionally, Lancium worked with stakeholders to develop and advance regulatory and protocol exemptions and changes that would be necessary to integrate its fast-ramping load technology into the ERCOT power grid. *See*, *e.g.*, LANCIUM00034729, LANCIUM00034731, LANCIUM00034688, LANCIUM00034990, LANCIUM00034963, LANCIUM00034940, LANCIUM00035284, LANCIUM00034927, LANCIUM00034932, LANCIUM00034921, LANCIUM00034923, LANCIUM00034916, LANCIUM00034877, LANCIUM00034883, LANCIUM00034868, LANCIUM00034853, LANCIUM00034858, LANCIUM00034831, LANCIUM00034821, LANCIUM00034772, LANCIUM00033707. Lancium also continued discussions with GlidePath for operation of a third-party datacenter container at a GlidePath site served by Lancium power skids and under Lancium Brain control. *See*, *e.g.*, LANCIUM00019196. Lancium also continued to pursue opportunities outside of ERCOT. *See*, *e.g.*, LANCIUM00021548, LANCIUM00021557, LANCIUM00021567, LANCIUM00029864.

By at least August 2019, Lancium qualified Lancium's R&D center as a Load Resource, continued working towards qualifying a Lancium wind farm site as a Load Resource and/or for ERS participation, and continued discussions with its power consultant and a QSE about further applying Lancium's technology towards demand response, Load Resource, and ERS opportunities. Lancium began participating in ERCOT demand response revenue generation at its R&D center via Lancium's QSE's Load Resource program. Lancium also adjusted its economic curtailment planning to assure that they consumed the obligated load they were awarded for each period. Additionally, Lancium executed a new addendum for fixed-price power purchasing, allowing Lancium to participate in energy arbitrage at its R&D center. Lancium incorporated into its revenue model decision making: (i) computing revenue plus demand response revenue, versus,

(ii) economic dispatch revenue through arbitrage. *See*, *e.g.*, LANCIUM00028482, LANCIUM00033064, LANCIUM00033065, LANCIUM00030838, LANCIUM00028485, LANCIUM00033062, LANCIUM00024122, LANCIUM00033055, LANCIUM00033240, LANCIUM00030839 (spreadsheet attachments LANCIUM00030840, LANCIUM00030841, LANCIUM00030842), LANCIUM00030782, LANCIUM00033215, LANCIUM00024173, LANCIUM00029321, LANCIUM00018672. Lancium also continued to innovate its software-controlled fast ramping (*e.g.*, operations control), overall system design (*e.g.*, site layouts), and high-heat tolerance modular containers (e.g., scope changes; panel design; structural design; 2MW module designs issued for construction; 4MW V-box iterations; miner density designs; demo box reconfiguration plans; removal of evaporative cooler). *See*, *e.g.*, LANCIUM00019208, LANCIUM00019212, LANCIUM00019217, LANCIUM00019222, LANCIUM00019227, LANCIUM00019125, LANCIUM00019130, LANCIUM00019139, LANCIUM00019143, LANCIUM00019151, LANCIUM00019155, LANCIUM00018898, LANCIUM00018904, LANCIUM00025517, LANCIUM00025518, LANCIUM00025419, LANCIUM00025420, LANCIUM00025496 LANCIUM00019105, LANCIUM00019109, LANCIUM00019116, LANCIUM00019124. Additionally, Lancium worked with stakeholders and hired a consultant to analyze, develop, and advance the regulatory and protocol exemptions and changes that would be necessary to integrate its fast-ramping load technology into the ERCOT power grid. *See*, *e.g.*, LANCIUM00034586, LANCIUM00034587, LANCIUM00033660, LANCIUM00033662, LANCIUM00033672, LANCIUM00033656, LANCIUM00034755, LANCIUM00033645, LANCIUM00033648, LANCIUM00033628, LANCIUM00033632, LANCIUM00033629, LANCIUM00033617. Lancium also continued discussions with GlidePath for operation of a third-party datacenter container at a GlidePath site served by Lancium power skids and under

Lancium Brain control. *See*, *e.g.*, LANCIUM00016879, LANCIUM00016880, LANCIUM00016881, LANCIUM00016882, LANCIUM00016883.

By at least September 2019, Lancium integrated its fast-ramping technology into ERCOT's ERS program, and continued working towards qualifying a Lancium behind-the-meter wind farm site as a Load Resource and/or for ERS participation, and continued discussions with its power consultant and a QSE about further applying Lancium's technology towards demand response, Load Resource, and ERS opportunities. *See*, *e.g.*, LANCIUM00018824, LANCIUM00018825, LANCIUM00025401, LANCIUM00025404, LANCIUM00025405, LANCIUM00033158, LANCIUM00024131, LANCIUM00024136, LANCIUM00024138, LANCIUM00033533, LANCIUM00033539. Also, at this time, Lancium understood that it might be able to qualify as a Controllable Load Resource under ERCOT's Controllable Load Resource program, and Lancium began investigating how to apply Lancium's technology to ancillary services (*e.g.*, NSPIN, RRS) as a CLR, how to qualify implementations of its technology as a CLR, and the economic viability of CLR participation. Lancium understood that CLR had existed for five years in ERCOT, that only one entity had tried to qualify, and that the entity failed. Lancium further understood it would have to follow ERCOT signals sent to a SCADA system (*e.g.*, such as the one installed for its Load Resource qualification) and use those signals to adjust load, all of which Lancium believed it could automate and integrate into its Lancium technology. *See*, *e.g.*, LANCIUM00033222, LANCIUM00024131, LANCIUM00021587, LANCIUM00030803, LANCIUM00031182, LANCIUM00031183. Lancium was also continuing to participate in ERCOT demand response revenue generation at its R&D center via Lancium's QSE's Load Resource program and also participating in power arbitrage.

By September 2019, Lancium could ramp loads in seconds, had 2.3MW of fast-ramping load participating in LR and ERS at its R&D center, and was planning 10MW-36MW of behind-the-meter Lancium technology going live at the Invenergy McAdoo windfarm by December 2019. *See*, *e.g.*, LANCIUM00024138, LANCIUM00021587. More specifically, for McAdoo, Lancium was continuing final development and planning, including: site and electrical preparation (power, electrical interconnects, transformers, protection and control); V-Box final design and construction; IT infrastructure loading; power operations plans for communications and dynamic response; and on-site testing and commissioning of ramping load technology. *See*, *e.g.*, LANCIUM00018910, LANCIUM00018927. At this time, Lancium also continued to innovate in clean compute module integration, wind generator integration, and power trading integration with its Load Resource integration (*e.g.*, evaluating economic considerations; demonstrating sub 10 second ramping ability; maintaining ancillary service award loads while participating in power trading), software-controlled fast ramping, overall system design, and high-heat tolerance modular containers. *See*, *e.g.*, LANCIUM00033194, LANCIUM00033143, LANCIUM00033474, LANCIUM00018824, LANCIUM00018825, LANCIUM00025404, LANCIUM00025405, LANCIUM00025398, LANCIUM00025400, LANCIUM00033158, LANCIUM00033222, LANCIUM00025385, LANCIUM00025386, LANCIUM00025394. Additionally, Lancium worked with stakeholders and its consultant to analyze, develop, and advance the regulatory and protocol exemptions and changes that would be necessary to integrate its fast-ramping load technology into the ERCOT power grid. *See*, *e.g.*, LANCIUM00033539.

By October 2019, Lancium investigated economic considerations of various qualifications, programs and methodologies to which it thought it could apply its technology, including ERS, 4CP avoidance, and ancillary services. LANCIUM00020782, LANCIUM00023630,

LANCIUM00030948, LANCIUM00030644, LANCIUM00031207, LANCIUM00030779, LANCIUM00030781, and LANCIUM00033094. Additionally, Lancium continued to work with stakeholders and its consultant to analyze, develop, and advance the regulatory and protocol exemptions, approvals, and changes that would be necessary to integrate its fast-ramping load technology into the ERCOT power grid. LANCIUM00033607, LANCIUM00033609, LANCIUM00032857, LANCIUM00033600, LANCIUM00033603, LANCIUM00033583, LANCIUM00033587, LANCIUM00034466, LANCIUM00034504, LANCIUM00034516, LANCIUM00034517, LANCIUM00034522, LANCIUM00034523, LANCIUM00034209, LANCIUM00034207, LANCIUM00033560, LANCIUM00033565, LANCIUM00030495, LANCIUM00030507, LANCIUM00030514, LANCIUM00030516, LANCIUM00030497, LANCIUM00030511, LANCIUM00033121. For McAdoo, Lancium was continuing final development and planning, including: site control server. LANCIUM00025237. Lancium continued to invest in R&D throughout 2019 (*see*, *e.g.*, LANCIUM00033518, LANCIUM00033519), and to protect the technology it invented by filing patent applications, including U.S. Provisional Application No. 62/927,119, the application from which the '433 Patent claims priority.

Lancium presently believes that the full combination of elements claimed in the '433 Patent were conceived between August 2019 and October 2019. For example, as set forth above, Lancium presently believes it conceived of means to apply its fast-ramping datacenter technology to ERCOT load management programs, such as participation in ancillary services such as RRS and NSPIN, around August 23, 2019. Also, with respect to controlling their fast-ramping datacenter technology, Lancium conceived of the combination of receiving power option data as recited, *e.g.*, in Claim 1, determining a performance strategy for a set of computing systems as

recited, *e.g.*, in Claim 1, and providing instructions to the computing systems as recited, *e.g.*, in Claim 1, around this time as well. *See*, *e.g.*, LANCIUM00032863, LANCIUM00032864, LANCIUM00019937, LANCIUM00021608, LANCIUM00030943, LANCIUM00021609, LANCIUM00021600, LANCIUM00021626, LANCIUM00031222, LANCIUM00031214, LANCIUM00021624, LANCIUM00021628, LANCIUM00028860, LANCIUM00030570, LANCIUM00021964. Lancium also conceived of providing instructions to the set of computing systems to perform one or more computational operations based on the foregoing performance strategy around this time. Lancium also believes that constructive reduction to practice occurred no later than October 28, 2019—the date Provisional Patent Application 62/927,119 was filed.

By no later than November 2019, Lancium moved to expedite CLR qualification of its technology. *See, e.g.,* LANCIUM00031216, LANCIUM00031220, LANCIUM00031226, LANCIUM00031178, LANCIUM00030947, LANCIUM00031212, LANCIUM00031213, LANCIUM00030790, LANCIUM00030791, LANCIUM00034267, LANCIUM00034269, LANCIUM00030590, LANCIUM00032631. Lancium also continued to work with stakeholders and its consultant to analyze, develop, and advance the regulatory and protocol exemptions, approvals, and changes that would be necessary to integrate its fast-ramping load technology into the ERCOT power grid, including as a CLR. LANCIUM00034351, LANCIUM00034342, LANCIUM00034344, LANCIUM00034347, LANCIUM00034309, LANCIUM00034283, LANCIUM00034284, LANCIUM00030590, LANCIUM00032918, LANCIUM00034247, LANCIUM00034250, LANCIUM00034253, LANCIUM00034257, LANCIUM00034261.

In December 2019, Lancium continued to advance CLR qualification of its technology, investigate the economic considerations of participating in ancillary services, and work with stakeholders and its consultant to analyze, develop, and advance the regulatory and protocol

exemptions, approvals, and changes that would be necessary to integrate its fast-ramping load technology into the ERCOT power grid, including as a CLR. LANCIUM00030752, LANCIUM00031206, LANCIUM00032673, LANCIUM00032674. On December 4, 2019, Lancium filed U.S. Application No. 16/702,931 which eventually issued as U.S. Patent No. 10,608,433.

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CERTIFICATE OF SERVICE

Please take notice that the undersigned hereby certifies that on December 23, 2021 a copy of ***Defendants' Second Supplemental Response to Plaintiffs' Interrogatory No. 3*** was served on all counsel of record by electronic mail:

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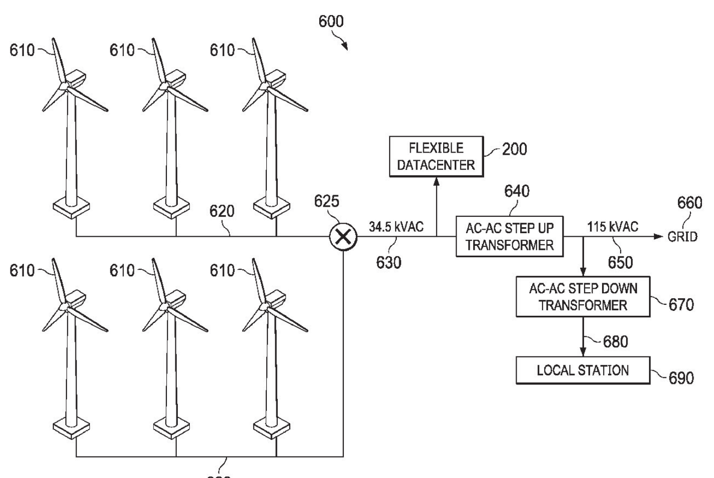

FIG. 6

TX013
BearBox v. Lancium
21-cv-00534

(57) Abstract: A flexible datacenter includes a mobile container, a behind-the-meter power input system, a power distribution system, a datacenter control system, a plurality of computing systems, and a climate control system. The datacenter control system modulates power delivery to the plurality of computing systems based on unutilized behind-the-meter power availability or an operational directive. A method of dynamic power delivery to a flexible datacenter using unutilized behind-the-meter power includes monitoring unutilized behind-the-meter power availability, determining when a datacenter ramp-up condition is met, enabling behind-the-meter power delivery to one or more computing systems when the datacenter ramp-up condition is met, and directing the one or more computing systems to perform predetermined computational operations.

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[Continued on next page]

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METHOD AND SYSTEM FOR DYNAMIC POWER DELIVERY TO A FLEXIBLE DATACENTER USING UNUTILIZED ENERGY SOURCES

BACKGROUND OF THE INVENTION

[0001] Blockchain technology was originally conceived of as an open and distributed system for securely conducting transactions with cryptographic currency. However, the foundational principle of blockchain technology is the ability to securely transact information of any type or kind between anonymous parties without intermediaries or a centralized trust authority. As such, blockchain technology finds application outside the realm of cryptocurrency and is widely considered one of the more robust and secure means of transacting information in the computer sciences.

[0002] In typical blockchain implementations, each participating party creates a digital identity, or wallet, which includes a pair of cryptographic keys used to transact information securely and anonymously with the blockchain. The blockchain may be thought of as a constantly growing database of all prior transaction information that is securely and coherently replicated across all nodes of a peer-to-peer blockchain network. The blockchain includes a sequence of blocks, where each block includes a bundle of transactions and other data including a hash of the prior block in the chain. As such, each block in the blockchain is mathematically related to the prior block, protecting the integrity of the blockchain from the most recently added block to the genesis block in the chain. Because anyone may participate in the curation of the blockchain, once a block is added, it becomes a permanent and immutable part of the blockchain. Thus, the blockchain stores transactions in a manner that prevents the transactions from being altered or otherwise corrupted, unless all subsequent blocks in the blockchain are also altered. The immutability of the blockchain makes the malicious alteration of a block exceptionally difficult, if not impossible, and at the very least makes it easy to detect and deter any such attempt before being accepted and replicated across the blockchain network.

[0003] Each transacting party of the blockchain uses a pair of cryptographic keys to anonymously transact information. The private key is a random number maintained in secrecy by the party holder that is used to derive a public key and sign information. The private key and the public key are mathematically related such that anyone holding the public key may verify that information signed with the private key originated from the holder of the private key. When an initiating party wishes to

transact information, the information is signed with the initiating party's private key and broadcast to the blockchain network. A biockchain miner uses the initiating party's public key to verify that the initiating party initiated, or signed, the transaction. Once the initiating party's signature is validated, the transaction is validated, added to the next block in the blockchain, and replicated across all nodes.

[0004] The computational overhead of the blockchain is largely due to hashing functions used by blockchain miners to discover new blocks. While computationally intensive, the work performed by miners is critically important to the functionality of the blockchain. When an initiating party's transaction request has been lodged and the signatures validated, the transaction request is pooled in the blockchain network. Blockchain miners validate transactions and compete to discover a new block to be added to the blockchain. In order to add a newly discovered block to the biockchain, the blockchain miner must provide a cryptographic proof of the discovered block. To create the proof, the miner inputs the hash value of the prior block in the blockchain, the candidate block to be added, and a random number, commonly referred to as the nonce, to a hash function. The hash function takes input of any length and outputs an alphanumeric string of fixed length, commonly referred to as a hash, which uniquely identifies the input. However, the blockchain algorithm requires that the hash start with a certain number of leading zeros as determined by the current level of prescribed difficulty. The blockchain network modulates the level of difficulty for block discovery, by varying the number of leading zeros required in the calculated hash, based on the amount of computing power in the blockchain network.

[0005] As more computational capacity has come online, the hash rate has increased dramatically. In an effort to keep the block discovery time constant, the blockchain network modulates difficulty every 2016 blocks discovered. If the blockchain network hash rate is too high and the amount of time taken to discover a new block is less than 10 minutes, the difficulty is increased proportionally to increase the block discovery time to 10 minutes. Similarly, if the blockchain hash rate is too low and the amount of time taken to discover a new block is more than 10 minutes, the difficulty is increased proportionally to reduce the block discovery time to 10 minutes. Because there is no way to predict what hash value a given set of input data will generate, miners often have to execute the hash function a substantial number of times, each time inputting a new nonce, to generate a new hash value.

When a miner is the first to obtain a hash value having the correct number of leading zeros, they broadcast the newly discovered block to the biockchain network and the biockchain is replicated across all nodes.

BRIEF SUMMARY OF THE INVENTION

[0006] According to one aspect of one or more embodiments of the present invention, a flexible datacenter includes a mobile container, a **behind-the-meter** power input system, a power distribution system, a datacenter control system, a plurality of computing systems, and a climate control system. The datacenter control system modulates power delivery to the plurality of computing systems based on unutilized behind-the-meter power availability or an operational directive.

[0007] According to one aspect of one or more embodiments of the present invention, a method of dynamic power delivery to a flexible datacenter using unutilized behind-the-meter power includes monitoring unutilized behind-the-meter power availability, determining **when** a datacenter ramp-up condition is met, enabling behind-the-meter power deliver}' to one or more computing systems when the datacenter ramp-up condition is met, and directing the one or more computing systems to perform predetermined computational operations.

[0008] Other aspects of the present invention **will** be apparent from the following description and claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] Figure **1** shows a computing system **in** accordance with one or more embodiments of the present invention.

[0010] Figure 2 shows a flexible datacenter in accordance with one or more embodiments of the present invention.

[0011] Figure 3 shows a three-phase power distribution of a flexible datacenter in accordance **with** one or more embodiments of the present invention.

[0012] Figure 4 shows a control distribution scheme of a flexible datacenter in accordance with one or more embodiments of the present invention.

[0013] Figure 5 shows a control distribution scheme of a fleet of flexible datacenters in accordance with one or more embodiments of the present invention.

[0014] Figure **6** show's a flexible datacenter **powered** by one or more wind turbines in accordance with one or more embodiments of the present invention.

[0015] Figure 7 shows a flexible datacenter powered by one or more solar panels in accordance with one or more embodiments of the present invention.

[0016] Figure 8 shows a flexible datacenter pow'ered by flare gas in accordance with one or more embodiments of the present invention.

[0017] Figure 9 shows a method of dynamic power delivery to a flexible datacenter using unutilized behind-the-meter power in accordance with one or more embodiments of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0018] One or more embodiments of the present invention are described in detail with reference to the accompanying figures. For consistency, like elements in the various figures are denoted by like reference numerals. In the following detailed description of the present invention, specific details are set forth in order to provide a thorough understanding of the present invention. In other instances, well-known features to one having ordinary skill in the art are not described to avoid obscuring the description of the present invention.

[0019] Blockchain miners are typically compensated for their efforts through either a discover}, fee or a fee paid by one or more of the transacting parties. Consequently, more and more computing resources are coming online to compete for these fees. As the number of computing resources increases, the blockchain network modulates the difficulty level, requiring hash values with more leading zeros. In essence, the increased difficulty means more hashing operations are required to find a valid hash. As such, there is an increasing number of computing resources executing an increasing number of hash functions that do not result in the discovery of a valid hash, yet still consume a substantial amount of power.

[0020] The intensive computational demand of blockchain applications makes the widespread adoption of blockchain technology ineffi cient and unsustainable from an energy and environmental perspective. In certain blockchain applications, with limited participation, roughly 5 quintillion 256-bit cryptographic hashes are created each and every' second of every day. While it is difficult to determine how much energy is required for that computational task, it is estimated to be in excess of 500 megawatts, the vast majority of which is sourced from fossil fuels. The majority of blockchain mining operations are currently being conducted in the People’s Republic of China and powered by coal-fired energy. As blockchain technology

proliferates, there is concern that the energy required to sustain such blockchain applications could exceed that of a developed country.

[0021] While future versions of blockchain technology may improve power consumption for various blockchain operations, including hashing functions, industry' efforts have focused on the development of central processing units ("CPUs"), graphics processing units ("GPUs"), and application specific integrated circuits ("ASICs") that are specifically designed to perform blockchain operations in a more efficient manner. While such efforts are beneficial, the issue remains, the widespread adoption of blockchain technology will require substantially more power than is economically and environmentally feasible.

[0022] Accordingly, in one or more embodiments of the present invention, a method and system for dynamic power delivery' to a flexible datacenter uses unutilized behind-the-meter power sources without transmission and distribution costs. The flexible datacenter may be configured to modulate power delivery to one or more computing systems based on the availability of unutilized behind-the-meter power or an operational directive. For example, the flexible datacenter may ramp-up to a fully online status, ramp-down to a fully offline status, or dynamically reduce power consumption, act a load balancer, or adjust the power factor. Advantageously, the flexible datacenter may perform computational operations, such as blockchain hashing operations, with little to no energy costs, using clean and renewable energy that would otherwise be wasted.

[0023] Figure 1 shows a computing system 100 in accordance with one or more embodiments of the present invention. Computing system 100 may include one or more central processing units (singular "CPU" or plural "CPUs") 105, host bridge 110, input/output ("IO") bridge 115, graphics processing units (singular "GPU" or plural "GPUs") 125, and/or application-specific integrated circuits (singular "ASIC or plural "ASICs") (not shown) disposed on one or more printed circuit boards (not shown) that are configured to perform computational operations. Each of the one or more CPUs 105, GPUs 125, or ASICs (not shown) may be a single-core (not independently illustrated) device or a multi-core (not independently illustrated) device. Multi-core devices typically include a plurality of cores (not shown) disposed on the same physical die (not shown) or a plurality of cores (not shown) disposed on multiple die (not shown) that are collectively disposed within the same mechanical package (not shown).

[0024] CPU 105 may be a general purpose computational device typically configured to execute software instructions. CPU 105 may include an interface 108 to host bridge **110**, an interface **118** to system memory 120, and an interface 123 to one or more IO devices, such as, for example, one or more GPUs 125. GPU 125 may serve as a specialized computational device typically configured to perform graphics functions related to frame buffer manipulation. However, one of ordinary skill in the art will recognize that GPU 125 may be used to perform non-graphics related functions that are computationally intensive. In certain embodiments, GPU 125 may interface 123 directly with CPU 125 (and interface **118** with system memory 120 through CPU 105). In other embodiments, GPU 125 may interface 121 with host bridge 110 (and interlace **116** or 118 with system memory 120 through host bridge **110** or CPU 105 depending on the application or design). In still other embodiments, GPU 125 may interface 133 with IO bridge 115 (and interface 116 or **118** with system memory 120 through host bridge **110** or CPU 105 depending on the application or design). The functionality of GPU 125 may be integrated, in whole or in part, with CPU 105.

[0025] Host bridge 110 may be an interface device configured to interface between the one or more computational devices and IO bridge 115 and, in some embodiments, system memory 120. Host bridge 110 may include an interface 108 to CPU 105, an interface 113 to IO bridge 115, for embodiments where CPU 105 does not include an interface **118** to system memory 120, an interface **116** to system memory 120, and for embodiments where CPU 105 does not include an integrated GPU 125 or an interface 123 to GPU 125, an interface 121 to GPU 125. The functionality of host bridge 110 may be integrated, in whole or in part, with CPU 105. IO bridge 115 may be an interface device configured to interface between the one or more computational devices and various IO devices *(e.g.,* 140, 145) and IO expansion, or add-on, devices (not independently illustrated). IO bridge 115 may include an interface 113 to host bridge 110, one or more interfaces 133 to one or more IO expansion devices 135, an interface 138 to keyboard 140, an interface 143 to mouse 145, an interface 148 to one or more local storage devices 150, and an interface 153 to one or more network interface devices 155. The functionality of IO bridge 115 may be integrated, in whole or in part, with CPU 105 or host bridge 110. Each local storage device 150, if any, may be a solid-state memory device, a solid-state memory device array, a hard disk drive, a hard disk drive array, or any other

non-transitory computer readable medium. Network interface device 155 may provide one or more network interfaces including any network protocol suitable to facilitate networked communications.

[0026] Computing system 100 may include one or more network-attached storage devices 160 in addition to, or instead of, one or more local storage devices 150. Each network-attached storage device 160, if any, may be a solid-state memory device, a solid-state memory device array, a hard disk drive, a hard disk drive array, or any other non-transitory computer readable medium. Network-attached storage device 160 may or may not be collocated with computing system 100 and may be accessible to computing system 100 via one or more network interfaces provided by one or more network interface devices 155.

[0027] One of ordinary skill in the art will recognize that computing system 100 may be a conventional computing system or an application-specific computing system. In certain embodiments, an application-specific computing system may include one or more ASICs (not shown) that are configured to perform one or more functions, such as hashing, in a more efficient manner. The one or more ASICs (not shown) may interface directly with CPU 105, host bridge 110, or GPU 125 or interface through IO bridge 115. Alternatively, in other embodiments, an application-specific computing system may be reduced to only those components necessary to perform a desired function in an effort to reduce one or more of chip count, printed circuit board footprint, thermal design power, and pow'er consumption. The one or more ASICs (not showm) may be used instead of one or more of CPU 105, host bridge 110, IO bridge 115, or GPU 125. In such systems, the one or more ASICs may incorporate sufficient functionality to perform certain network and computational functions in a minimal footprint with substantially fewer component devices.

[0028] As such, one of ordinary skill in the art will recognize that CPU 105, host bridge 110, IO bridge 115, GPU 125, or ASIC (not shown) or a subset, superset, or combination of functions or features thereof, may be integrated, distributed, or excluded, in whole or in part, based on an application, design, or form factor in accordance with one or more embodiments of the present invention. Thus, the description of computing system 100 is merely exemplary and not intended to limit the type, kind, or configuration of component devices that constitute a computing system 100 suitable for performing computing operations in accordance with one or more embodiments of the present invention.

[0029] One of ordinary skill in the art will recognize that computing system 100 may be a stand alone, laptop, desktop, server, blade, or rack mountable system and may vary based on an application or design.

[0030] Figure **2** shows a flexible datacenter 200 in accordance with one or more embodiments of the present invention. Flexible datacenter 200 may include a mobile container 205, a behind-the-meter power input system 210, a power distribution system **215,** a climate control system *(e.g.,* 250, 260, 270, 280, and/or 290), a datacenter control system 220, and a plurality of computing systems 100 disposed in one or more racks 240. Datacenter control system 220 may be a computing system *(e.g.,* 100 of Figure 1) configured to dynamically modulate power delivery to one or more computing systems 100 disposed within flexible datacenter 200 based on unutilized behind-the-meter power availability or an operational directive from a local station control system (not shown), a remote master control system (not shown), or a grid operator (not shown).

[0031] In certain embodiments, mobile container 205 may be a storage trailer disposed on wheels and configured for rapid deployment. In other embodiments, mobile container 205 may be a storage container (not shown) configured for placement on the ground and potentially stacked in a vertical manner (not shown). In still other embodiments, mobile container 205 may be an inflatable container, a floating container, or any other type or kind of container suitable for housing a mobile datacenter 200.

[0032] Flexible datacenter 200 may be rapidly deployed on site near a source of unutilized behind-the-meter power generation. Behind-the-meter power input system 210 may be configured to input power to flexible datacenter 200. Behind-the-meter power input system 210 may include a first input (not independently illustrated) configured to receive three-phase behind-the-meter alternating current ("AC") voltage. In certain embodiments, behind-the-meter power input system 210 may include a supervisory AC-to-AC step-down transformer (not shown) configured to step down three-phase behind-the-meter AC voltage to single-phase supervisory nominal AC voltage or a second input (not independently illustrated) configured to receive single-phase supervisory nominal AC voltage from the local station (not shown) or a metered source (not shown). Behind-the-meter power input system 210 may provide single-phase supervisory nominal AC voltage to datacenter control system 220, which may remain powered at almost all times to control the

operation of flexible datacenter 200. The first input (not independently illustrated) or a third input (not independently illustrated) of behind-the-meter power input system 210 may direct three-phase behind-the-meter AC voltage to an operational AC-to-AC step-down transformer (not shown) configured to controllably step down three-phase behind-the-meter AC voltage to three-phase nominal AC voltage. Datacenter control system 220 may controllably enable or disable generation or provision of three-phase nominal AC voltage by the operational AC-to-AC step-down transformer (not shown).

[0033] Behind-the-meter power input system 210 may provide three phases of three-phase nominal AC voltage to power distribution system 215. Power distribution system 215 may controllably provide a single phase of three-phase nominal AC voltage to each computing system 100 or group 240 of computing systems **100** disposed within flexible datacenter 200. Datacenter control system 220 may controllably select which phase of three-phase nominal AC voltage that power distribution system 215 provides to each computing system 100 or group 240 of computing systems 100. In this way, datacenter control system 220 may modulate power delivery by either ramping-up flexible datacenter 200 to fully operational status, ramping-down flexible datacenter 200 to offline status (where only datacenter control system 220 remains powered), reducing power consumption by withdrawing power delivery from, or reducing power to, one or more computing systems 100 or groups 240 of computing systems 100, or modulating a power factor correction factor for the local station by controllably adjusting which phases of three-phase nominal AC voltage are used by one or more computing systems 100 or groups 240 of computing systems 100.

[0034] Flexible datacenter 200 may include a climate control system *(e.g,* 250, 260, 270, 280, 290) configured to maintain the plurality of computing systems 100 within their operational temperature range. In certain embodiments, the climate control system may include an air intake 250, an evaporative cooling system 270, a fan 280, and an air outtake 260. In other embodiments, the climate control system may include an air intake 250, an air conditioner or refrigerant cooling system 290, and an air outtake 260. In still other embodiments, the climate control system may include a computer room air conditioner system (not shown), a computer room air handler system (not shown), or an immersive cooling system (not shown). One of ordinary skill in the art will recognize that any suitable heat extraction system (not

shown) configured to maintain the operation of the plurality of computing systems 100 within their operational temperature range may be used in accordance with one or more embodiments of the present invention.

[0035] Flexible datacenter 200 may include a battery' system (not shown) configured to convert three-phase nominal AC voltage to nominal DC voltage and store power in a plurality of storage ceils. The battery, system (not shown) may include a DC-to-AC inverter configured to convert nominal DC voltage to three-phase nominal AC voltage for flexible datacenter 200 use. Alternatively, the battery system (not shown) may include a DC-to-AC inverter configured to convert nominal DC voltage to single-phase nominal AC voltage to power datacenter control system 220.

[0036] One of ordinary, skill in the art will recognize that a voltage level of three-phase behind-the-meter AC voltage may vary based on an application or design and the type or kind of local power generation. As such, a type, kind, or configuration of the operational AC-to-AC step down transformer (not shown) may vary based on the application or design. In addition, the frequency and voltage level of three-phase nominal AC voltage, single-phase nominal AC voltage, and nominal DC voltage may vary based on the application or design in accordance with one or more embodiments of the present invention.

[0037] Figure 3 shows a three-phase power distribution of a flexible datacenter 200 in accordance with one or more embodiments of the present invention. Flexible datacenter 200 may include a plurality of racks 240, each of which may include one or more computing systems 100 disposed therein. As discussed above, the behind-the-meter pow'er input system (210 of Figure 2) may provide three phases of three-phase nominal AC voltage to the power distribution system (215 of Figure 2). The power distribution system (215 of Figure 2) may controllably provide a single phase of three-phase nominal AC voltage to each computing system 100 or group 240 of computing systems 100 disposed within flexible datacenter 200. For example, a flexible datacenter 200 may include eighteen racks 240, each of which may include eighteen computing systems 100. The power distribution system (215 of Figure 2) may control which phase of three-phase nominal AC voltage is provided to one or more computing systems 100, a rack 240 of computing systems 100, or a group *(e.g.,* 310, 320, or 330) of racks 240 of computing systems 100.

[0038] In the figure, for purposes of illustration only, eighteen racks 240 are divided into a first group of six racks 310, a second group of six racks 320, and a third group

of six racks 330, where each rack contains eighteen computing systems 100. The power distribution system (215 of Figure 2) may, for example, provide a first phase of three-phase nominal AC voltage to the first group of six racks 310, a second phase of three-phase nominal AC voltage to the second group of six racks 320, and a third phase of three-phase nominal AC voltage to the third group of six racks 330. If the flexible datacenter (200 of Figure **2**) receives an operational directive from the local station (not shown) to provide power factor correction, the datacenter control system (220 of Figure 2) may direct the pow'er distribution system (215 of Figure 2) to adjust which phase or phases of three-phase nominal AC voltage are used to provide the power factor correction required by the local station (not shown) or grid operator (not shown). One of ordinary skill in the art will recognize that, in addition to the power distribution, the load may be varied by adjusting the number of computing systems 100 operatively powered. As such, the flexible datacenter (200 of Figure 2) may be configured to act as a capacitive or inductive load to provide the appropriate reactance necessary to achieve the power factor correction required by the local station (not shown).

[0039] Figure 4 show's a control distribution scheme of a flexible datacenter 200 in accordance with one or more embodiments of the present invention. Datacenter control system 220 may independently, or cooperatively with one or more of local station control system 410, remote master control system 420, and grid operator 440, modulate power delivery to flexible datacenter 200. Specifically, power delivery' may be dynamically adjusted based on conditions or operational directives.

[0040] Local station control system 410 may be a computing system *(e.g,* 100 of Figure 1) that is configured to control various aspects of the local station (not independently illustrated) that generates power and sometimes generates unutilized behind-the-meter power. Local station control system 410 may communicate with remote master control system 420 over a networked connection 430 and with datacenter control system 220 over a networked or hardwired connection 415. Remote master control system 420 may be a computing system *(e.g.,* 100 of Figure 1) that is located offsite, but connected via a network connection 425 to datacenter control system 220, that is configured to provide supervisory or override control of flexible datacenter 200 or a fleet (not shown) of flexible datacenters 200. Grid operator 440 may be a computing system *(e.g,* 100 of Figure 1) that is configured to control various aspects of the grid (not independently illustrated) that receives

power from the local station (not independently illustrated). Grid operator 440 may communicate with local station control system 440 over a networked or hardwired connection 445.

[0041] Datacenter control system 220 may monitor unutilized behind-the-meter power availability at the local station (not independently illustrated) and determine when a datacenter ramp-up condition is met. Unutilized behind-the-meter power availability may include one or more of excess local power generation, excess local power generation that the grid cannot accept, local power generation that is subject to economic curtailment, local power generation that is subject to reliability curtailment, local power generation that is subject to power factor correction, situations where local power generation is prohibitively low, start up situations, transient situations, or testing situations where there is an economic advantage to using locally generated behind-the-meter power generation, specifically power available at little to no cost and with no associated transmission or distribution costs.

[0042] The datacenter ramp-up condition may he met if there is sufficient behind-the-meter power availability and there is no operational directive from local station control system 410, remote master control system 420, or grid operator 440 to go offline or reduce power. As such, datacenter control system 220 may enable 435 behind-the-meter power input system 210 to provide three-phase nominal AC voltage to the power distribution system (215 of Figure 2) to power the plurality of computing systems (100 of Figure 2) or a subset thereof. Datacenter control system 220 may optionally direct one or more computing systems (**100** of Figure 2) to perform predetermined computational operations. For example, if the one or more computing systems (**100** of Figure 2) are configured to perform blockchain hashing operations, datacenter control system 220 may direct them to perform blockchain hashing operations for a specific blockchain application, such as, for example, Bitcoin, Litecoin, or Ethereum. Alternatively, one or more computing systems (100 of Figure 2) may be configured to independently receive a computational directive from a network connection (not shown) to a peer-to-peer blockchain network (not shown) such as, for example, a network for a specific blockchain application, to perform predetermined computational operations.

[0043] Remote master control system 420 may specify to datacenter control system 220 what sufficient behind-the-meter power availability constitutes, or datacenter

control system 220 may be programmed with a predetermined preference or criteria on which to make the determination independently. For example, in certain circumstances, sufficient behind-the-meter power availability may be less than that required to fully power the entire flexible datacenter 200. In such circumstances, datacenter control system 220 may provide power to only a subset of computing systems (100 of Figure 2), or operate the plurality of computing systems (100 of Figure 2) in a lower power mode, that is within the sufficient, but less than full, range of power that is available.

[0044] While flexible datacenter 200 is online and operational, a datacenter ramp-down condition may be met when there is insufficient, or anticipated to be insufficient, behind-the-meter power availability or there is an operational directive from local station control system **410,** remote master control system 420, or grid operator 440. Datacenter control system 220 may monitor and determine when there is insufficient, or anticipated to be insufficient, behind-the-meter power availability. As noted above, sufficiency may be specified by remote master control system 420 or datacenter control system 220 may be programmed with a predetermined preference or criteria on which to make the determination independently. An operational directive may be based on current dispatchability, forward looking forecasts for when unutilized behind-the-meter power is, or is expected to be, available, economic considerations, reliability considerations, operational considerations, or the discretion of the local station 410, remote master control 420, or grid operator 440. For example, local station control system 410, remote master control system 420, or grid operator 440 may issue an operational directive to flexible datacenter 200 to go offline and power down. When the datacenter ramp-down condition is met, datacenter control system 220 may disable pow'er delivery to the plurality of computing systems (100 of Figure 2). Datacenter control system 220 may disable 435 behind-the-meter power input system 210 from providing three-phase nominal AC voltage to the power distribution system (215 of Figure 2) to power down the plurality of computing systems (100 of Figure 2), while datacenter control system 220 remains powered and is capable of rebooting flexible datacenter 200 when unutilized behind-the-meter power becomes available again.

[0045] While flexible datacenter 200 is online and operational, changed conditions or an operational directive may cause datacenter control system 220 to modulate power consumption by flexible datacenter 200. Datacenter control system 220 may

determine, or local station control system 410, remote master control system 420, or grid operator 440 may communicate, that a change in local conditions may result in less power generation, availability, or economic feasibility, than would be necessary to fully power flexible datacenter 200. In such situations, datacenter control system 220 may take steps to reduce or stop power consumption by flexible datacenter 200 (other than that required to maintain operation of datacenter control system 220). Alternatively, local station control system 410, remote master control system 420, or grid operator 440, may issue an operational directive to reduce power consumption for any reason, the cause of which may be unknown. In response, datacenter control system 220 may dynamically reduce or withdraw power delivery to one or more computing systems (100 of Figure 2) to meet the dictate. Datacenter control system 220 may controllably provide three-phase nominal AC voltage to a smaller subset of computing systems (100 of Figure 2) to reduce power consumption. Datacenter control system 220 may dynamically reduce the power consumption of one or more computing systems (100 of Figure 2) by reducing their operating frequency or forcing them into a lower power mode through a network directive.

[0046] One of ordinary skill in the art will recognize that datacenter control system 220 may be configured to have a number of different configurations, such as a number or type or kind of computing systems (100 of Figure 2) that may be powered, and in what operating mode, that correspond to a number of different ranges of sufficient and available unutilized behind-the-meter power availability. As such, datacenter control system 220 may modulate power delivery over a variety of ranges of sufficient and available unutilized behind-the-meter power availability.

[0047] Figure 5 shows a control distribution of a fleet 500 of flexible datacenters 200 in accordance with one or more embodiments of the present invention. The control distribution of a flexible datacenter 200 shown and described with respect to Figure 4 may be extended to a fleet 500 of flexible datacenters 200. For example, a first local station (not independently illustrated), such as, for example, a wind farm (not shown), may include a first plurality 510 of flexible datacenters 200« through 200*d*, which may be collocated or distributed across the local station (not shown). A second local station (not independently illustrated), such as, for example, another wind farm or a solar farm (not shown), may include a second plurality 520 of flexible datacenters 200e through 200/y which may he collocated or distributed

across the local station (not shown). One of ordinary skill in the art will recognize that the number of flexible datacenters 200 deployed at a given station and the number of stations within the fleet may vary based on an application or design in accordance with one or more embodiments of the present invention.

[0048] Remote master control system 420 may provide supervisory control over fleet 500 of flexible datacenters 200 in a similar manner to that shown and described with respect to Figure 4, with the added flexibility to make high level decisions with respect to fleet 500 that may be counterintuitive to a given station. Remote master control system 420 may make decisions regarding the issuance of operational directives to a given local station based on, for example, the status of each local station where flexible datacenters 200 are deployed, the workload distributed across fleet 500, and the expected computational demand required for the expected workload. In addition, remote master control system 420 may shift workloads from a first plurality **510** of flexible datacenters 200 to a second plurality 520 of flexible datacenters 200 for any reason, including, for example, a loss of unutilized behind-the-meter pow'er availability at one local station and the availability of unutilized behind-the-meter power at another local station.

[0049] Figure 6 shows a flexible datacenter 200 powered by one or more wind turbines 610 in accordance with one or more embodiments of the present invention. A wind farm 600 typically includes a plurality of wind turbines 610, each of which intermittently generates a wind-generated AC voltage. The wind-generated AC voltage may vary based on a type, kind, or configuration of farm 600, turbine 610, and incident wind speed. The wind-generated AC voltage is typically input into a turbine AC-to-AC step-up transformer (not shown) that is disposed within the nacelle (not independently illustrated) or at the base of the mast (not independently illustrated) of turbine 610. The turbine AC-to-AC step up transformer (not shown) outputs three-phase wind-generated AC voltage 620. Three-phase wind-generated AC voltage 620 produced by the plurality of wind turbines 610 is collected 625 and provided 630 to another AC-to-AC step-up transformer 640 that steps up three-phase wind-generated AC voltage 620 to three-phase grid AC voltage 650 suitable for deliver}, to grid 660. Three-phase grid AC voltage 650 may be stepped down with an AC-to-AC step-down transformer 670 configured to produce three-phase local station AC voltage 680 provided to local station 690. One of ordinary skill in the art will recognize that the actual voltage levels may vary based on the type, kind,

or number of wind turbines 610, the configuration or design of wind farm 600, and grid 660 that it feeds into.

[0050] The output side of AC-to-AC step-up transformer 640 that connects to grid 660 may be metered and is typically subject to transmission and distribution costs. In contrast, power consumed on the input side of AC-to-AC step-up transformer 640 may be considered behind-the-meter and is typically not subject to transmission and distribution costs. As such, one or more flexible datacenters 200 may be powered by three-phase wind-generated AC voltage 620. Specifically, in wind farm 600 applications, the three-phase behind-the-meter AC voltage used to power flexible datacenter 200 may be three-phase wind-generated AC voltage 620. As such, flexible datacenter 200 may reside behind-the-meter, avoid transmission and distribution costs, and may be dynamically powered when unutilized behind-the-meter power is available.

[0051] Unutilized behind-the-meter pow'er availability may occur when there is excess local power generation. In high wind conditions, wind farm 600 may generate more power than, for example, AC-to-AC step-up transformer 640 is rated for. In such situations, wind farm 600 may have to take steps to protect its equipment from damage, which may include taking one or more turbines 610 offline or shunting their voltage to dummy loads or ground. Advantageously, one or more flexible datacenters 200 may be used to consume power on the input side of AC-to-AC step-up transformer 640, thereby allowing wind farm 600 to operate equipment within operating ranges while flexible datacenter 200 receives behind-the-meter power without transmission or distribution costs. The local station control system (not independently illustrated) of local station 690 may issue an operational directive to the one or more flexible datacenters 200 or to the remote master control system (420 of Figure 4) to ramp-up to the desired power consumption level. When the operational directive requires the cooperative action of multiple flexible datacenters 200, the remote mater control system (420 of Figure 4) may determine how to power each individual flexible datacenter 200 in accordance with the operational directive or provide an override to each flexible datacenter 200.

[0052] Another example of unutilized behind-the-meter power availability is when grid 660 cannot, for whatever reason, take the power being produced by wind farm 600. In such situations, wind farm 600 may have to take one or more turbines 610 offline or shunt their voltage to dummy loads or ground. Advantageously, one or

more flexible datacenters 200 may be used to consume power on the input side of AC-to-AC step-up transformer 640, thereby allowing wind farm 600 to either produce pow'er to grid 660 at a lower level or shut down transformer 640 entirely while flexible datacenter 200 receives behind-the-meter power without transmission or distribution costs. The local station control system (not independently illustrated) of local station 690 or the grid operator (not independently illustrated) of grid 660 may issue an operational directive to the one or more flexible datacenters 200 or to the remote master control system (420 of Figure 4) to ramp-up to the desired power consumption level. When the operational directive requires the cooperative action of multiple flexible datacenters 200, the remote master control system (420 of Figure 4) may determine how to power each individual flexible datacenter 200 in accordance with the operational directive or provide an override to each flexible datacenter 200.

[0053] Another example of unutilized behind-the-meter power availability is when wind farm 600 is selling power to grid 660 at a negative price that is offset by a production tax credit. In certain circumstances, the value of the production tax credit may exceed the price wind farm 600 would have to pay to grid 660 to offload their generated power. Advantageously, one or more flexible datacenters 200 may be used to consume power behind-the-meter, thereby allowing wind farm 600 to produce and obtain the production tax credit, but sell less power to grid 660 at the negative price. The local station control system (not independently illustrated) of local station 690 may issue an operational directive to the one or more flexible datacenters 200 or to the remote master control system (420 of Figure 4) to ramp-up to the desired power consumption level. When the operational directive requires the cooperative action of multiple flexible datacenter 200, the remote master control system (420 of Figure 4) may determine how to power each individual flexible datacenter 200 in accordance with the operational directive or provide an override to each flexible datacenter 200.

[0054] Another example of unutilized behind-the-meter power availability is when wind farm 600 is selling power to grid 660 at a negative price because grid 660 is oversupplied or is instructed to stand down and stop producing altogether. The grid operator (not independently illustrated) may select certain power generation stations to go offline and stop producing power to grid 660. Advantageously, one or more flexible datacenters 200 may be used to consume power behind-the-meter, thereby

allowing wind farm 600 to stop producing power to grid 660, but making productive use of the power generated behind-the-meter without transmission or distribution costs. The local station control system (not independently illustrated) of the local station 690 or the grid operator (not independently illustrated) of grid 660 may issue an operational directive to the one or more flexible datacenters 200 or to the remote master control system (420 of Figure 4) to ramp-up to the desired power consumption level. When the operational directive requires the cooperative action of multiple flexible datacenters 200, the remote master control system (420 of Figure 4) may determine how to power each individual flexible datacenter 200 in accordance with the operational directive or provide an override to each flexible datacenter 200.

[0055] Another example of unutilized behind-the-meter power availability is when wind farm 600 is producing power to grid 660 that is unstable, out of phase, or at the wrong frequency, or grid 660 is already unstable, out of phase, or at the wrong frequency for whatever reason. The grid operator (not independently illustrated) may select certain power generation stations to go offline and stop producing power to grid 660. Advantageously, one or more flexible datacenters 200 may be used to consume power behind-the-meter, thereby allowing wind farm 600 to stop producing power to grid 660, but make productive use of the power generated behind-the-meter without transmission or distribution costs. The local station control system (not independently illustrated) of local station 690 may issue an operational directive to the one or more flexible datacenters 200 or to the remote master control system (420 of Figure 4) to ramp-up to the desired power consumption level. When the operational directive requires the cooperative action of multiple flexible datacenters 200, the remote master control system (420 of Figure 4) may determine how to power each individual flexible datacenter 200 in accordance with the operational directive or provide an override to each flexible datacenter 200.

[0056] Further examples of unutilized behind-the-meter power availability is when wind farm 600 experiences low wind conditions that make it not economically feasible to power up certain components, such as, for example, the local station (not independently illustrated), but there may be sufficient behind-the-meter power availability to power one or more flexible datacenters 200. Similarly, unutilized behind-the-meter power availability may occur when wind farm 600 is starting up,

or testing, one or more turbines 610. Turbines 610 are frequently offline for installation, maintenance, and sendee and must be tested prior to coming online as part of the array. One or more flexible datacenters 200 may be powered by one or more turbines 610 that are offline from farm 600. The above-noted examples of when unutilized behind-the-meter power is available are merely exemplary and are not intended to limit the scope of what one of ordinary skill in the art would recognize as unutilized behind-the-meter power availability. Unutilized behind-the-meter power availability may occur anytime there is power available and accessible behind-the-meter that is not subject to transmission and distribution costs and there is an economic advantage to using it.

[0057] One of ordinary skill in the art will recognize that wind farm 600 and wind turbine 610 may vary based on an application or design in accordance with one or more embodiments of the present invention.

[0058] Figure 7 shows a flexible datacenter 200 powered by one or more solar panels 710 in accordance with one or more embodiments of the present invention. A solar farm 700 typically includes a plurality of solar panels 710, each of which intermittently generates a solar-generated DC voltage 720. Solar-generated DC voltage 720 may vary based on a type, kind, or configuration of farm 700, panel 710, and incident sunlight. Solar-generated DC voltage 720 produced by the plurality of solar panels 710 is collected 725 and provided 730 to a DC-to-AC inverter that converts solar-generated DC voltage into three-phase solar-generated AC voltage 750. Three-phase solar-generated AC voltage 750 is provided to an AC-to-AC step-up transformer 760 that steps up three-phase solar-generated AC voltage to three-phase grid AC voltage 790. Three-phase grid AC voltage 790 may be stepped down with an AC-to-AC step-down transformer 785 configured to produce three-phase local station AC voltage 777 provided to local station 775. One of ordinary skill in the art will recognize that the actual voltage levels may vary' based on the type, kind, or number of solar panels 710, the configuration or design of solar farm 700, and grid 790 that it feeds into.

[0059] The output side of AC-to-AC step-up transformer 760 that connects to grid 790 may be metered and is typically subject to transmission and distribution costs. In contrast, power consumed on the input side of AC-to-AC step-up transformer 760 may be considered behind-the-meter and is typically not subject to transmission and distribution costs. As such, one or more flexible datacenters 200 may be powered by

three-phase solar-generated AC voltage 750. Specifically, in solar farm 700 applications, the three-phase behind-the-meter AC voltage used to power flexible datacenter 200 may be three-phase solar-generated AC voltage 750. As such, flexible datacenter 200 may reside behind-the-meter, avoid transmission and distribution costs, and may be dynamically powered when unutilized behind-the-meter power is available.

[0060] Unutilized behind-the-meter power availability may occur when there is excess local power generation. In high incident sunlight situations, solar farm 700 may generate more power than, for example, AC-to-AC step-up transformer 760 is rated for. In such situations, solar farm 700 may have to take steps to protect its equipment from damage, which may include taking one or more panels 710 offline or shunting their voltage to dummy loads or ground. Advantageously, one or more flexible datacenters 200 may be used to consume power on the input side of AC-to-AC step-up transformer 760, thereby allowing solar farm 700 to operate equipment within operating ranges while flexible datacenter 200 receives behind-the-meter power without transmission or distribution costs. The local station control system (not independently illustrated) of local station 775 may issue an operational directive to the one or more flexible datacenters 200 or to the remote master control system (420 of Figure 4) to ramp-up to the desired power consumption level. When the operational directive requires the cooperative action of multiple flexible datacenters 200, the remote mater control system (420 of Figure 4) may determine how to power each individual flexible datacenter 200 in accordance with the operational directive or provide an override to each flexible datacenter 200.

[0061] Another example of unutilized behind-the-meter power availability is when grid 790 cannot, for whatever reason, take the power being produced by solar farm 700. In such situations, solar farm 700 may have to take one or more panels 710 offline or shunt their voltage to dummy loads or ground. Advantageously, one or more flexible datacenters 200 may be used to consume power on the input side of AC-to-AC step-up transformer 760, thereby allowing solar farm 700 to either produce power to grid 790 at a lower level or shut down transformer 760 entirely while flexible datacenter 200 receives behind-the-meter power without transmission or distribution costs. The local station control system (not independently illustrated) of local station 775 or the grid operator (not independently illustrated) of grid 790 may issue an operational directive to the one or more flexible datacenters 200 or to

the remote master control system (420 of Figure 4) to ramp-up to the desired power consumption level. When the operational directive requires the cooperative action of multiple flexible datacenters 200, the remote master control system (420 of Figure 4) may determine how to power each individual flexible datacenter 200 in accordance with the operational directive or provide an override to each flexible datacenter 200.

[0062] Another example of unutilized behind-the-meter power availability is when solar farm 700 is selling power to grid 790 at a negative price that is offset by a production tax credit. In certain circumstances, the value of the production tax credit may exceed the price solar farm 700 would have to pay to grid 790 to offload their generated power. Advantageously, one or more flexible datacenters 200 may be used to consume power behind-the-meter, thereby allowing solar farm 700 to produce and obtain the production tax credit, but sell less power to grid 790 at the negative price. The local station control system (not independently illustrated) of local station 775 may issue an operational directive to the one or more flexible datacenters 200 or to the remote master control system (420 of Figure 4) to ramp-up to the desired power consumption level. When the operational directive requires the cooperative action of multiple flexible datacenter 200, the remote master control system (420 of Figure 4) may determine how to power each individual flexible datacenter 200 in accordance with the operational directive or provide an override to each flexible datacenter 200.

[0063] Another example of unutilized behind-the-meter power availability is when solar farm 700 is selling power to grid 790 at a negative price because grid 790 is oversupplied or is instructed to stand down and stop producing altogether. The grid operator (not independently illustrated) may select certain power generation stations to go offline and stop producing power to grid 790. Advantageously, one or more flexible datacenters 200 may be used to consume power behind-the-meter, thereby allowing solar farm 700 to stop producing power to grid 790, but making productive use of the power generated behind-the-meter without transmission or distribution costs. The local station control system (not independently illustrated) of the local station *775* or the grid operator (not independently illustrated) of grid 790 may issue an operational directive to the one or more flexible datacenters 200 or to the remote master control system (420 of Figure 4) to ramp-up to the desired power consumption level. When the operational directive requires the cooperative action of

multiple flexible datacenters 200, the remote master control system (420 of Figure 4) may determine how to power each individual flexible datacenter 200 in accordance with the operational directive or provide an override to each flexible datacenter 200.

[0064] Another example of unutilized behind-the-meter power availability is when solar farm 700 is producing power to grid 790 that is unstable, out of phase, or at the wrong frequency, or grid 790 is already unstable, out of phase, or at the wrong frequency for whatever reason. The grid operator (not independently illustrated) may select certain power generation stations to go offline and stop producing power to grid 790. Advantageously, one or more flexible datacenters 200 may be used to consume power behind-the-meter, thereby allowing solar farm 700 to stop producing power to grid 790, but make productive use of the power generated behind-the-meter without transmission or distribution costs. The local station control system (not independently illustrated) of local station 775 may issue an operational directive to the one or more flexible datacenters 200 or to the remote master control system (420 of Figure 4) to ramp-up to the desired power consumption level. When the operational directive requires the cooperative action of multiple flexible datacenters 200, the remote master control system (420 of Figure 4) may determine how to power each individual flexible datacenter 200 in accordance with the operational directive or provide an override to each flexible datacenter 200.

[0065] Further examples of unutilized behind-the-meter power availability is when solar farm 700 experiences intermittent cloud cover such that it is not economically feasible to power up certain components, such as, for example local station 775, but there may be sufficient behind-the-meter power availability to power one or more flexible datacenters 200. Similarly, unutilized behind-the-meter power availability may occur when solar farm 700 is starting up, or testing, one or more panels 710. Panels 710 are frequently offline for installation, maintenance, and service and must be tested prior to coming online as part of the array. One or more flexible datacenters 200 may be powered by one or more panels 710 that are offline from farm 700. The above-noted examples of when unutilized behind-the-meter power is available are merely exemplary- and are not intended to limit the scope of what one of ordinary skill in the art would recognize as unutilized behind-the-meter power availability. Behind-the-meter power availability may occur anytime there is power

available and accessible behind-the-meter that is not subject to transmission and distribution costs and there is an economic advantage to using it.

[0066] One of ordinary skill in the art will recognize that solar farm 700 and solar panel 710 may vary based on an application or design in accordance with one or more embodiments of the present invention.

[0067] Figure 8 shows a flexible datacenter 200 powered by flare gas 800 in accordance with one or more embodiments of the present invention. Flare gas 800 is combustible gas produced as a product or by-product of petroleum refineries, chemical plants, natural gas processing plants, oil and gas drilling rigs, and oil and gas production facilities. Flare gas 800 is typically burned off through a flare stack (not shown) or vented into the air. In one or more embodiments of the present invention, flare gas 800 may be diverted 812 to a gas-powered generator that produces three-phase gas-generated AC voltage 822. This power may be considered behind-the-meter and is not subject to transmission and distribution costs. As such, one or more flexible datacenters 200 may be powered by three-phase gas-generated AC voltage. Specifically, the three-phase behind-the-meter AC voltage used to power flexible datacenter 200 may be three-phase gas-generated AC voltage 822. Accordingly, flexible datacenter 200 may reside behind-the-meter, avoid transmission and distribution costs, and may be dynamically powered when unutilized behind-the-meter power is available.

[0068] Figure 9 shows a method of dynamic power delivery to a flexible datacenter (200 of Figure 2) using unutilized behind-the-meter power 900 in accordance with one or more embodiments of the present invention. In step 910, the datacenter control system (220 of Figure 4), or the remote master control system (420 of Figure 4), may monitor unutilized behind-the-meter power availability. In certain embodiments, monitoring may include receiving information or an operational directive from the local station control system (410 of Figure 4) or the grid operator (440 of Figure 4) corresponding to unutilized behind-the-meter power availability.

[0069] In step 920, the datacenter control system (220 of Figure 4), or the remote master control system (420 of Figure 4), may determine when a datacenter ramp-up condition is met. In certain embodiments, the datacenter ramp-up condition may be met when there is sufficient behind-the-meter power availability and there is no operational directive from the local station to go offline or reduce power. In step 930, the datacenter control system (220 of Figure 4) may enable behind-the-meter

power delivery to one or more computing systems (100 of Figure 2). In step 940, once ramped-up, the datacenter control system (220 of Figure 4) or the remote master control system (420 of Figure 4) may direct one or more computing systems (100 of Figure 2) to perform predetermined computational operations. In certain embodiments, the predetermined computational operations may include the execution of one or more hashing functions.

[0070] While operational, the datacenter control system (220 of Figure 4), or the remote master control system (420 of Figure 4), may receive an operational directive to modulate power consumption. In certain embodiments, the operational directive may be a directive to reduce power consumption. In such embodiments, the datacenter control system (220 of Figure 4) or the remote master control system (420 of Figure 4) may dynamically reduce power delivery to one or more computing systems (100 of Figure 2) or dynamically reduce power consumption of one or more computing systems. In other embodiments, the operational directive may be a directive to provide a power factor correction factor. In such embodiments, the datacenter control system (220 of Figure 4) or the remote master control system (420 of Figure 4) may dynamically adjust power delivery to one or more computing systems (100 of Figure 2) to achieve a desired power factor correction factor. In still other embodiments, the operational directive may be a directive to go offline or power down. In such embodiments, the datacenter control system (220 of Figure 4) may disable power delivery to one or more computing systems (100 of Figure 2).

[0071] The datacenter control system (220 of Figure 4), or the remote master control system (420 of Figure 4), may determine when a datacenter ramp-down condition is met. In certain embodiments, the datacenter ramp-down condition may be met if there is insufficient or anticipated to be insufficient behind-the-meter power availability or there is an operational directive from the local station to go offline or reduce power. The datacenter control system (220 of Figure 4) may disable behind-the-meter power delivery, to one or more computing systems (100 of Figure 2). Once ramped-down, the datacenter control system (220 of Figure 4) remains powered and in communication with the remote master control system (420 of Figure 4) so that it may dynamically power the flexible datacenter (200 of Figure 2) when conditions change.

[0072] One of ordinary skill in the art will recognize that a datacenter control system (220 of Figure 4) may dynamically modulate power delivery' to one or more

computing systems (100 of Figure 2) of a flexible datacenter (200 of Figure 2) based on unutilized behind-the-meter power availability or an operational directive. The flexible datacenter (200 of Figure 2) may transition between a fully powered down state (while the datacenter control system remains powered), a fully powered up state, and various intermediate states in between. In addition, flexible datacenter (200 of Figure 2) may have a blackout state, where ail power consumption, including that of the datacenter control system (220 of Figure 4) is halted. However, once the flexible datacenter (200 of Figure 2) enters the blackout state, it will have to be manually rebooted to restore power to datacenter control system (220 of Figure 4). Local station conditions or operational directives may cause flexible datacenter (200 of Figure 2) to ramp-up, reduce power consumpti on, change power factor, or ramp-down.

[0073] Advantages of one or more embodiments of the present invention may include one or more of the following:

[0074] In one or more embodiments of the present invention, a method and system for dynamic power delivery to a flexible datacenter using unutilized energy sources provides a green solution to two prominent problems: the exponential increase in power required for growing blockchain operations and the unutilized and typically wasted energy generated from renewable energy sources.

[0075] In one or more embodiments of the present invention, a method and system for dynamic power deliver}- to a flexible datacenter using unutilized energy sources allows for the rapid deployment of mobile datacenters to local stations. The mobile datacenters may be deployed on site, near the source of power generation, and receive unutilized behind-the-meter power when it is available.

[0076] In one or more embodiments of the present invention, a method and system for dynamic power deliver}- to a flexible datacenter using unutilized energy sources allows for the power delivery to the datacenter to be modulated based on conditions or an operational directive received from the local station or the grid operator.

[0077] In one or more embodiments of the present invention, a method and system for dynamic power deliver}- to a flexible datacenter using unutilized energy sources may dynamically adjust power consumption by ramping-up, ramping-down, or adjusting the power consumption of one or more computing systems within the flexible datacenter.

[0078] In one or more embodiments of the present invention, a method and system for dynamic power delivery to a flexible datacenter using unutilized energy sources may be powered by unutilized behind-the-meter power that is free from transmission and distribution costs. As such, the flexible datacenter may perform computational operations, such as hashing function operations, with little to no energy cost.

[0079] In one or more embodiments of the present invention, a method and system for dynamic power delivery to a flexible datacenter using unutilized energy sources provides a number of benefits to the hosting local station. The local station may use the flexible datacenter to adjust a load, provide a power factor correction, to offload power, or operate in a manner that invokes a production tax credit.

[0080] While the present invention has been described with respect to the above-noted embodiments, those skilled in the art, having the benefit of this disclosure, will recognize that other embodiments may be devised that are within the scope of the invention as disclosed herein. Accordingly, the scope of the invention should be limited only by the appended claims.

CLAIMS

What is claimed is:

1. A flexible datacenter comprising:
   a mobile container;
   a behind-the-meter power input system;
   a power distribution system;
   a datacenter control system;
   a plurality of computing systems; and
   a climate control system,
   wherein the datacenter control system modulates power delivery to the plurality of computing systems based on unutilized behind-the-meter power availability or an operational directive.

2. The flexible datacenter of claim 1, further comprising:
   a remote master control system.

3. The flexible datacenter of claim 1, wherein the behind-the-meter power input system comprises an input configured to receive three-phase behind-the-meter AC voltage and a supervisory AC-to-AC step-down transformer configured to step down the three-phase behind-the-meter AC voltage to a single-phase supervisory nominal AC voltage or an input configured to receive single-phase supervisory nominal AC voltage from a local station or metered source.

4. The flexible datacenter of claim 3, wherein the behind-the-meter power input system provides the single-phase supervisory nominal AC voltage to the datacenter control system.

5. The flexible datacenter of claim 1, wherein the behind-the-meter power input system comprises an input configured to receive three-phase behind-the-meter AC voltage and an operational AC-to-AC step-down transformer configured to controllab!y step down the three-phase behind-the-meter AC voltage to three-phase nominal AC voltage.

6. The flexible datacenter of claim 5, wherein the datacenter control system controllably enables or disables generation of the three-phase nominal AC voltage by the operational AC-to-AC step-down transformer.

7. The flexible datacenter of claim 1, wherein the behind-the-meter power input system provides three-phases of the three-phase nominal AC voltage to the power distribution system.

8. The flexible datacenter of claim 7, wherein the power distribution system controllably provides a single phase of the three-phase nominal AC voltage to each computing system of the plurality of computing systems.

9. The flexible data center of claim 7, wherein the datacenter control system controllably selects which phase of the three-phase nominal AC voltage the power distribution system provides to each computing system of the plurality of computing systems.

10. The flexible datacenter of claim 7, wherein the datacenter control system modulates a power factor correction factor by controllably adjusting which phase of the three-phase nominal AC voltage each computing system of the plurality of computing systems receive.

11. The flexible datacenter of claim 5, wherein the three-phase behind-the-meter AC voltage comprises a three-phase wind-generated AC voltage output by one or more wind turbines prior to an AC-to-AC step-up transformer that steps up the three-phase wind-generated AC voltage to a three-phase grid AC voltage.

12. The flexible datacenter of claim 5, wherein the three-phase behind-the-meter AC voltage comprises a three-phase solar-generated AC voltage output by a DC-to-AC inverter that inputs solar-generated DC voltage from one or more solar panels and prior to an AC-to-AC step-up transformer that steps up the three-phase solar-generated AC voltage to a three-phase grid AC voltage.

13. The flexible datacenter of claim 5, wherein the three-phase behind-the-meter AC voltage comprises a three-phase gas-generated AC voltage output by a generator that inputs combustible gas diverted from a flare or venting system.

14. The flexible datacenter of claim 5, wherein the three-phase behind-the-meter AC voltage is a three-phase metered AC voltage.

15. The flexible datacenter of claim 1, wherein unutilized behind-the-meter power availability comprises one or more of excess local power generation at a local station level, excess local power generation that a grid cannot receive, local power generation subject to economic curtailment, local power generation subject to reliability curtailment, local power generation subject to power factor correction, low local power generation, start up local power generation situations, transient local power generation situations, or testing local power generation situations where there is an economic advantage to using local behind-the-meter power generation to power the flexible datacenter.

16. The flexible datacenter of claim 1, wherein an operational directive comprises one or more of a local station directive, a remote master control directive, or a grid directive.

17. The flexible datacenter of claim 1, wherein an operational directive comprises one or more of a dispatchability directive or a forecast directive.

18. The flexible datacenter of claim 1, wherein an operational directive comprises a workload directive based on actual behind-the-meter power availability or projected behind-the-meter power availability.

19. The flexible datacenter of claim 2, wherein the remote master control system dynamically adjusts power delivery to the flexible datacenter based on a remote master control directive.

20. The flexible datacenter of claim 1, wherein the climate control system comprises a computer room air conditioner system, a computer room air handler system, an evaporative cooling system, a refrigerant cooling system, an immersive cooling system,

or any other suitable heat extraction system configured to operate the plurality of computing systems within their operational temperature range.

21. The flexible datacenter of claim 1, wherein the mobile container comprises a storage container configured for placement on a ground surface.

22. The flexible datacenter of claim 1, wherein the mobile container comprises a storage trailer on wheels.

23. The flexible datacenter of claim 5, further comprising a battery system configured to convert the three-phase nominal AC voltage to DC nominal voltage and store power in a plurality of storage cells.

24. The flexible datacenter of claim 23, wherein the DC nominal voltage from the plurality of storage cells are converted via a DC-to-AC inverter to three-phase nominal AC voltage for flexible datacenter use.

25. A method of dynamic power delivery to a flexible datacenter using unutilized behind-the-meter power comprising:

monitoring unutilized behind-the-meter power availability;

determining when a datacenter ramp-up condition is met;

enabling behind-the-meter power delivery to one or more computing systems when the datacenter ramp-up condition is met; and

directing the one or more computing systems to perform predetermined computational operations.

26. The method of claim 25, further comprising;

determining when a datacenter ramp-down condition is met; and

disabling power delivery to one or more computing systems when the datacenter ramp-down condition is met.

27. The method of claim 25, further comprising:

receiving an operational directive to go offline; and

disabling power delivery to the one or more computing systems.

28. The method of claim 25, further comprising:
    receiving an operational directive to reduce power consumption, and
    dynamically reducing power delivery to a subset of the one or more computing systems.

29. The method of claim 25, further comprising:
    receiving an operational directive to reduce power consumption; and
    dynamically reducing power consumption of the one or more computing systems.

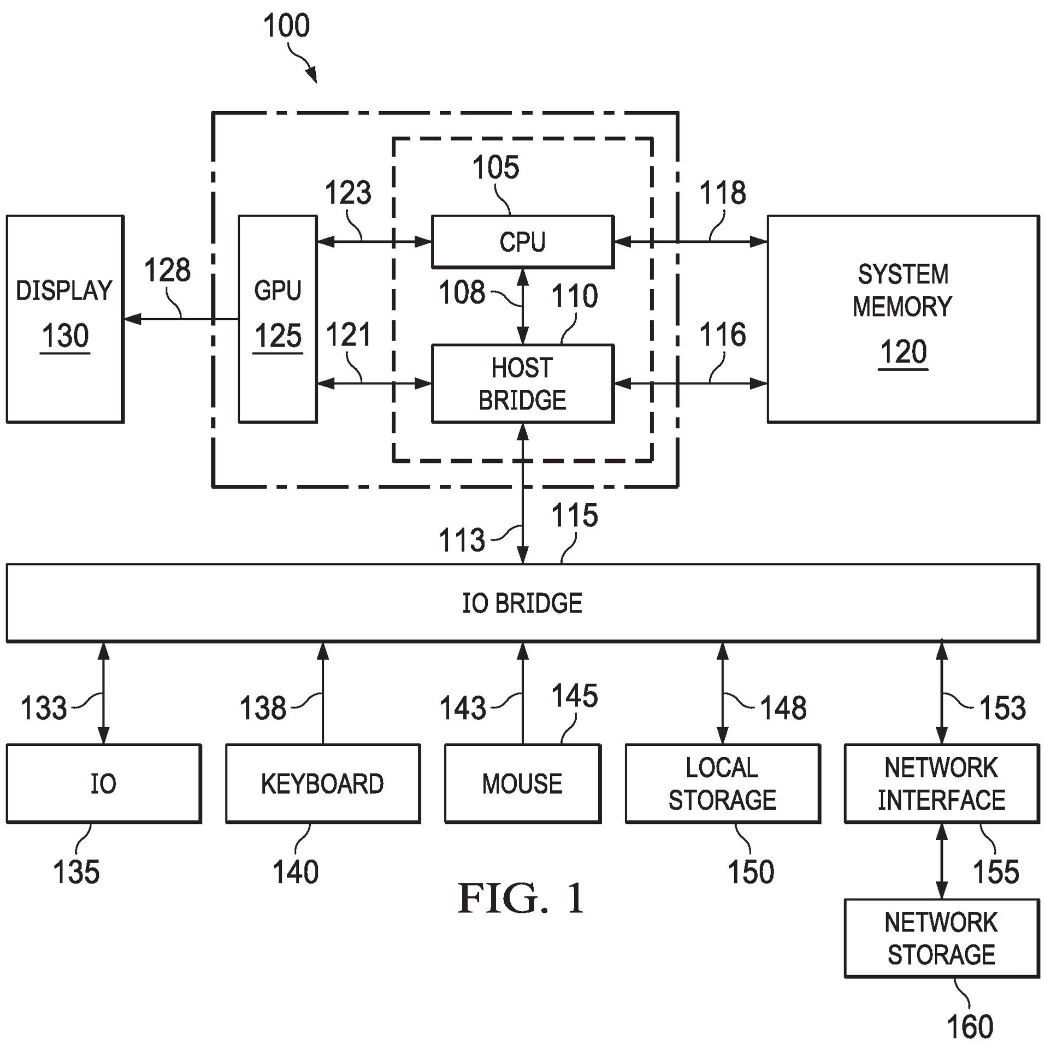
30. The method of claim 25, further comprising:
    receiving an operational directive to provide power factor correction; and
    dynamically adjusting power delivery to a subset of the one or more computing systems to achieve a desired power factor correction factor.

31. The method of claim 25, wherein unutilized behind-the-meter power availability comprises one or more of excess local power generation at a local station level, excess local power generation that a grid cannot receive, local power generation subject to economic curtailment, local power generation subject to reliability curtailment, local power generation subject to power factor correction, low local power generation, start up local power generation situations, transient local power generation situations, or testing local power generation situations where there is an economic advantage to using local behind-the-meter power generation.

32. The method of claim 25, wherein the datacenter ramp-up condition is met if there is sufficient behind-the-meter power availability and there is no operational directive from a local station to go offline.

33. The method of claim 25, wherein the datacenter ramp-down condition is met if there is insufficient behind-the-meter power availability or there is an operational directive from a local station to go offline.

34. The method of claim 25, wherein the predetermined computational operations comprise execution of one or more hashing functions.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143
145
148
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NETWORK
STORAGE
160

FIG. 1

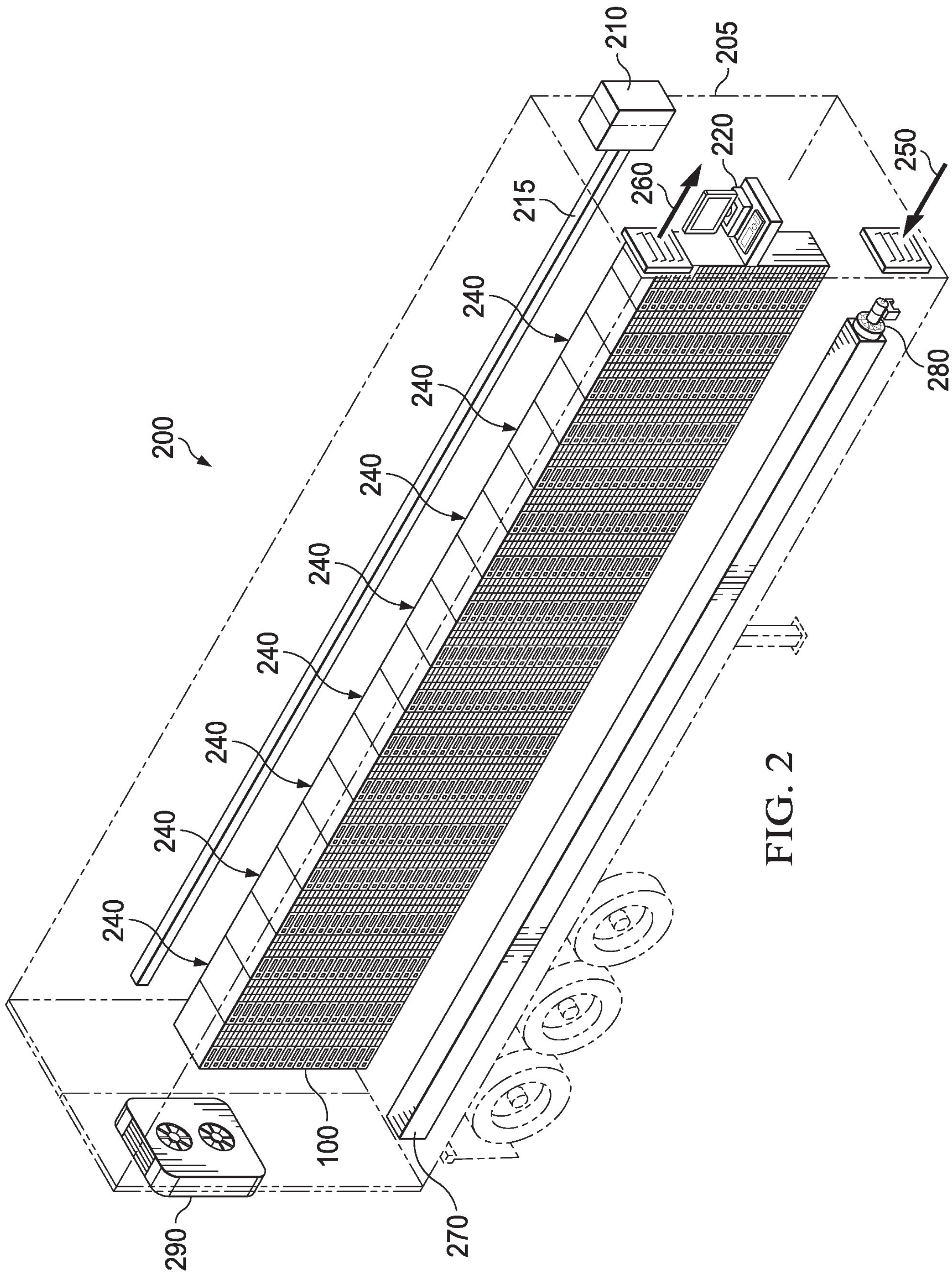
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FIG. 2

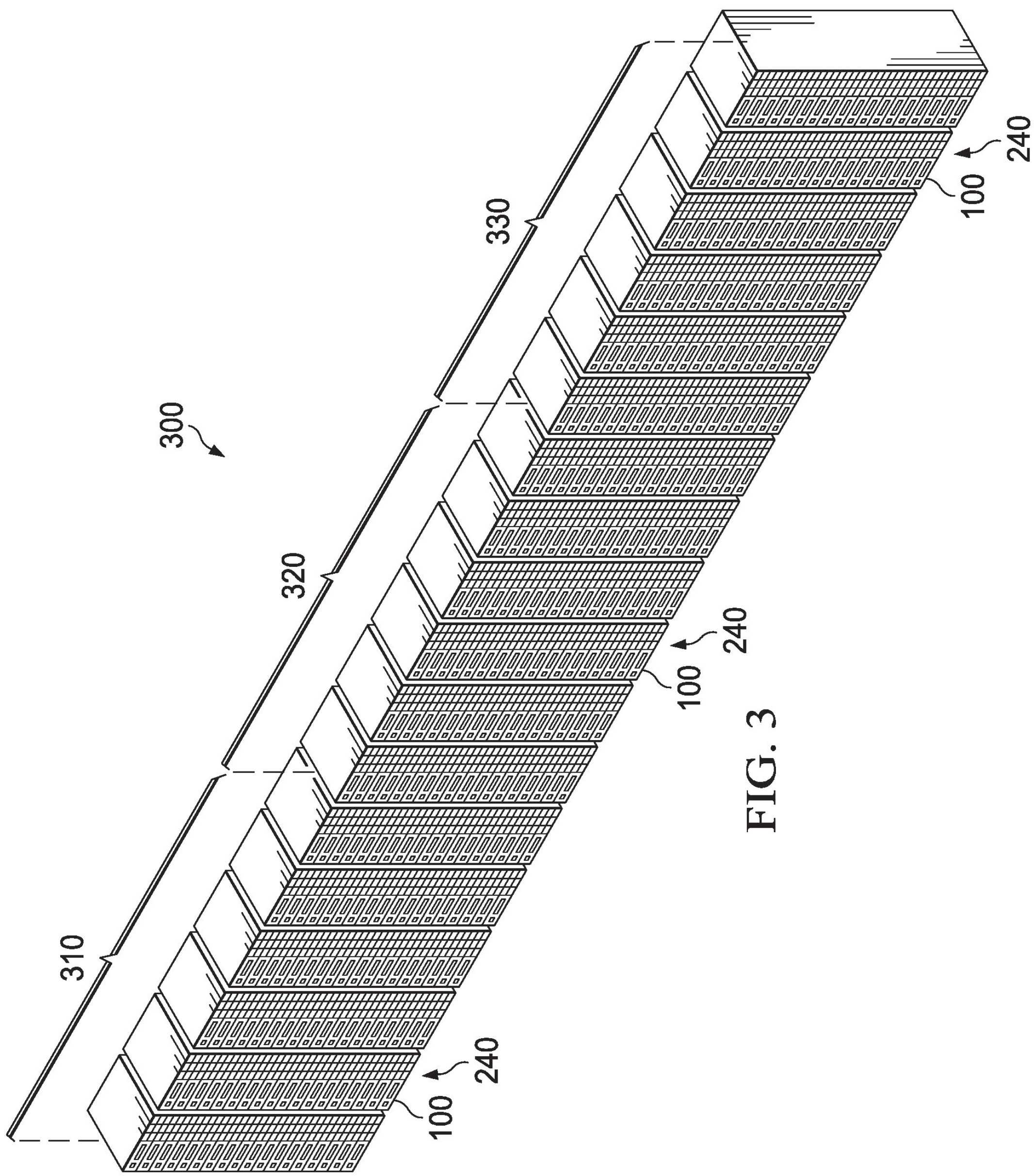

FIG. 3

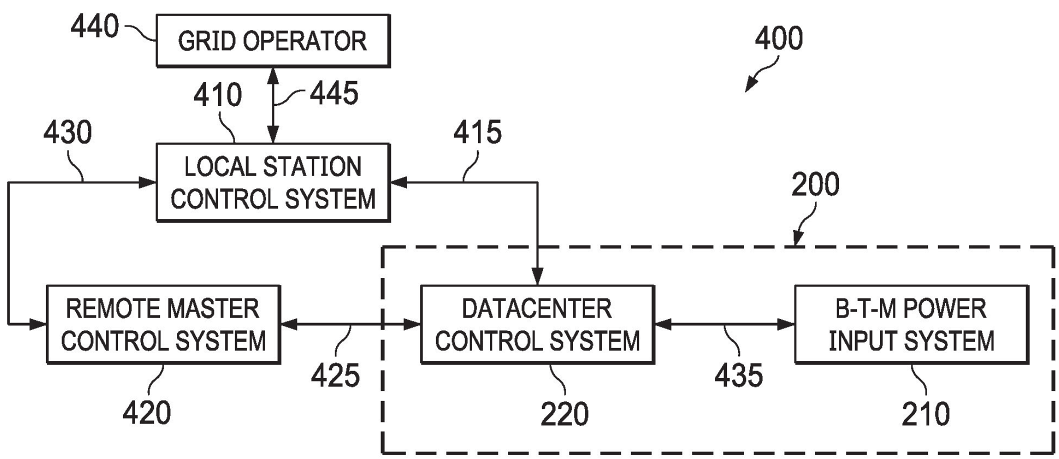
440
GRID OPERATOR
410
445
430
LOCAL STATION CONTROL SYSTEM
415
400
200
REMOTE MASTER CONTROL SYSTEM
DATACENTER CONTROL SYSTEM
B-T-M POWER INPUT SYSTEM
425
435
420
220
210

FIG. 4

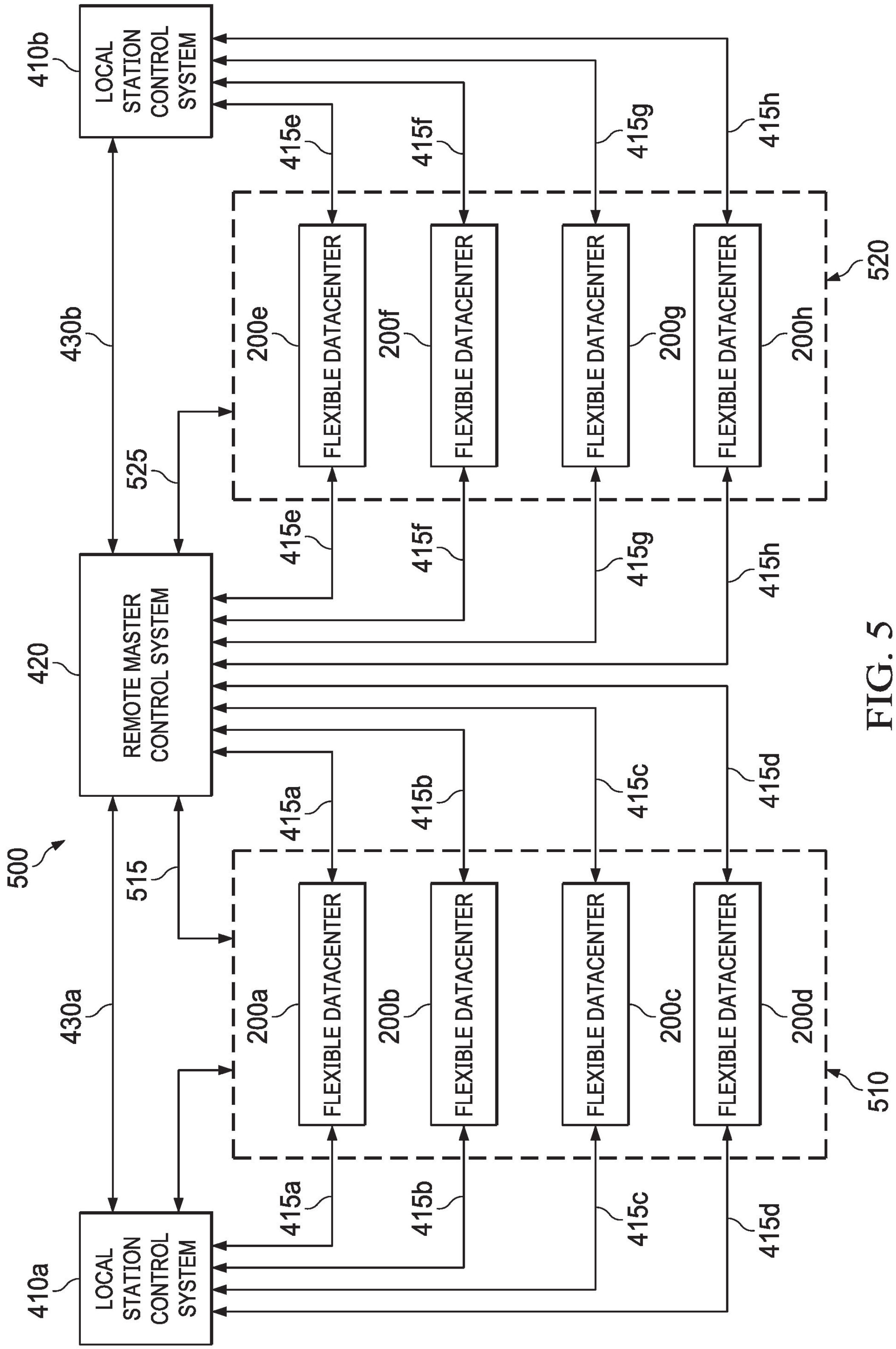
500
410a
LOCAL STATION CONTROL SYSTEM
410b
LOCAL STATION CONTROL SYSTEM
420
REMOTE MASTER CONTROL SYSTEM
430a
430b
515
525
510
520
415a
415b
415c
415d
415e
415f
415g
415h
200a
200b
200c
200d
200e
200f
200g
200h
FLEXIBLE DATACENTER

FIG. 5

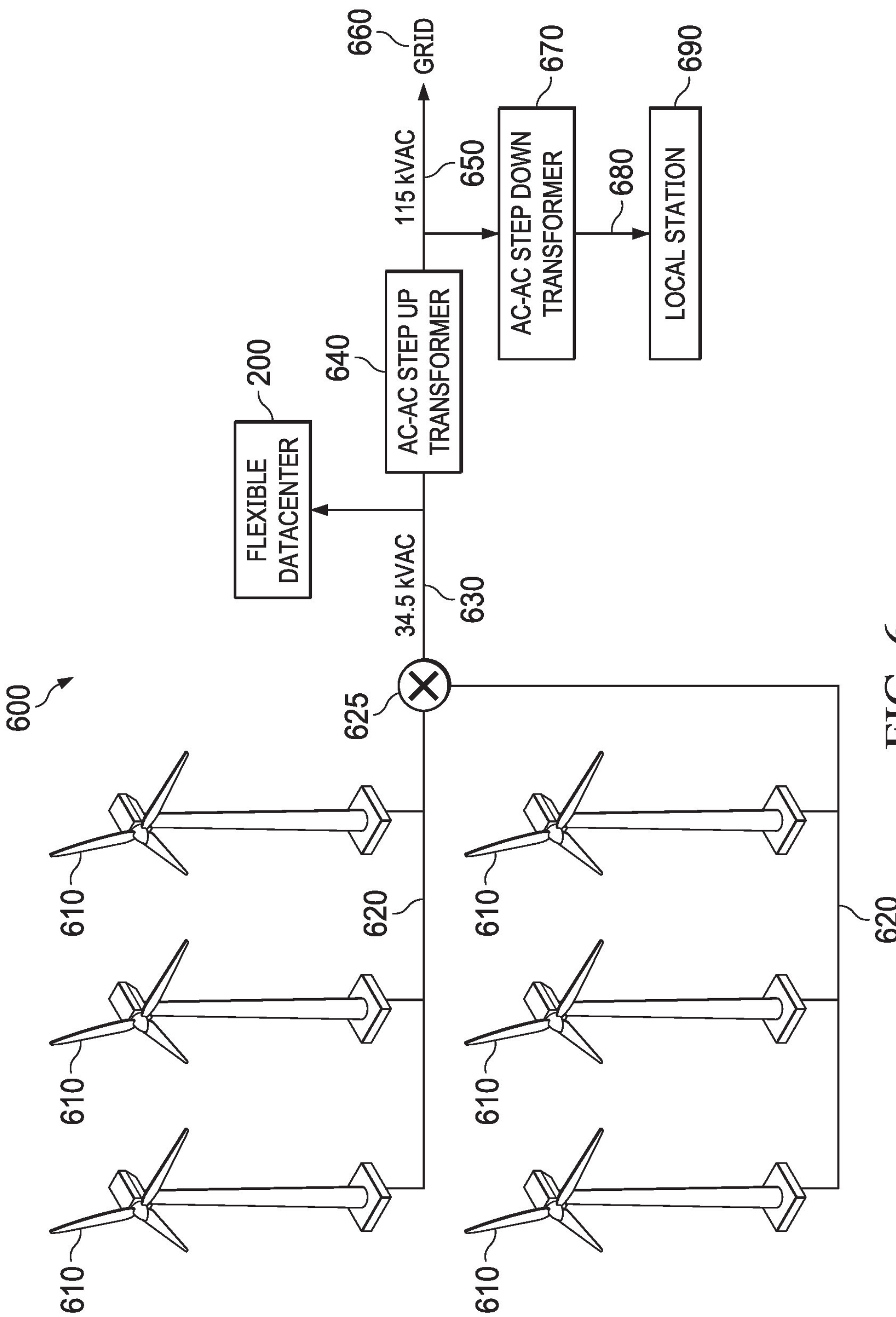
600
610
610
610
610
610
610
620
620
625
34.5 kVAC
630
FLEXIBLE DATACENTER
200
AC-AC STEP UP TRANSFORMER
640
115 kVAC
650
GRID
660
AC-AC STEP DOWN TRANSFORMER
670
680
LOCAL STATION
690

FIG. 6

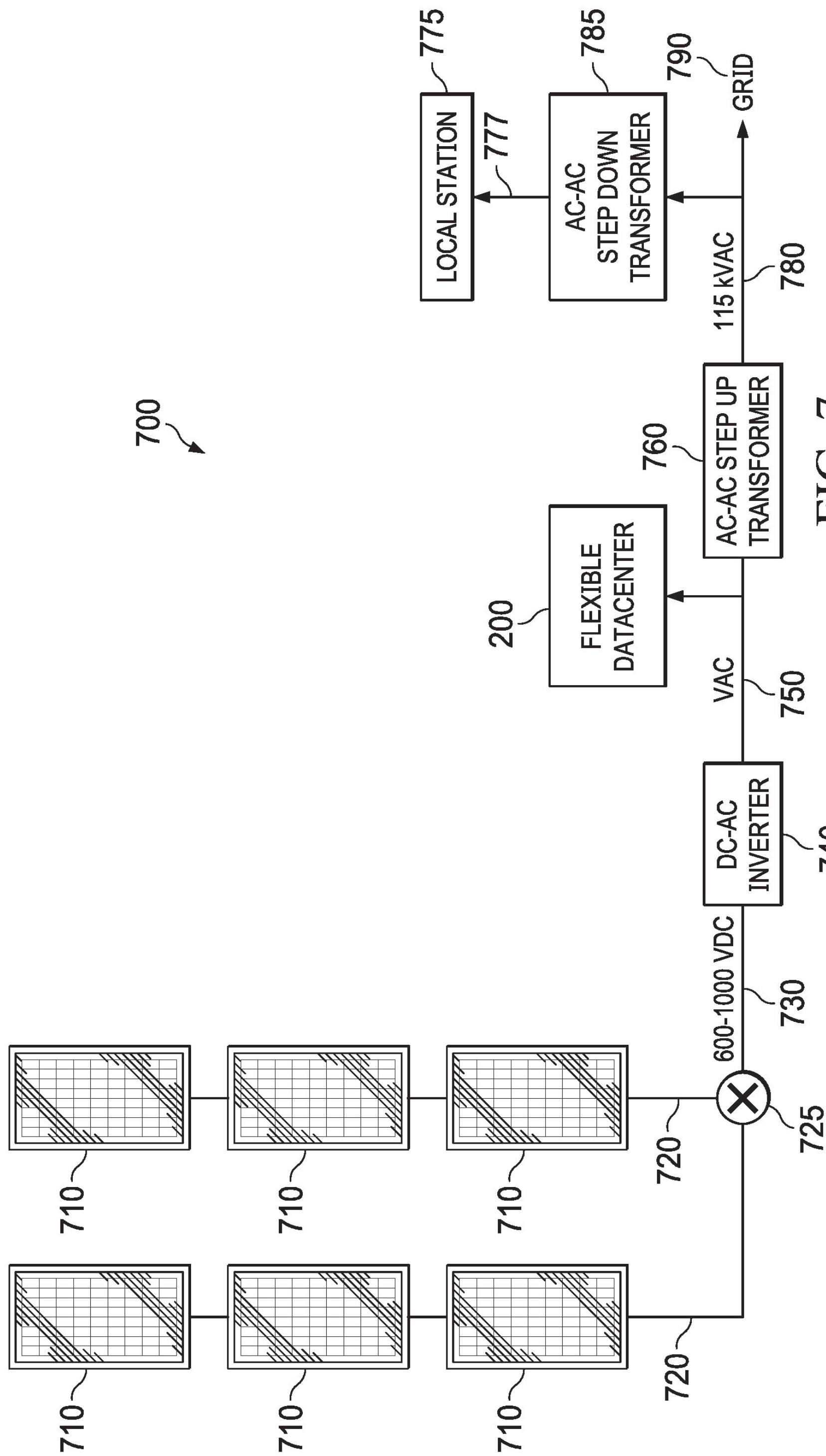
700
775
LOCAL STATION
777
785
AC-AC
STEP DOWN
TRANSFORMER
790
GRID
115 kVAC
780
760
AC-AC STEP UP
TRANSFORMER
200
FLEXIBLE
DATACENTER
VAC
750
DC-AC
INVERTER
740
600-1000 VDC
730
725
720
720
710
710
710
710
710
710

FIG. 7

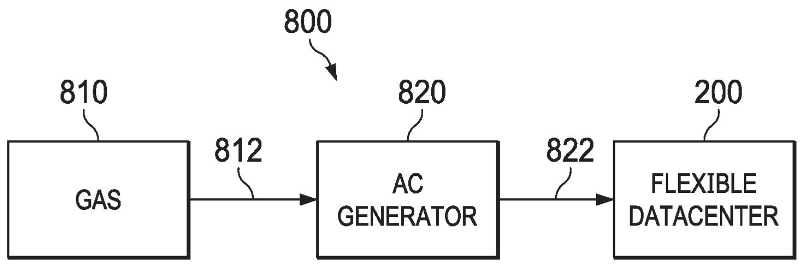
800
810
GAS
812
820
AC GENERATOR
822
200
FLEXIBLE DATACENTER

FIG. 8

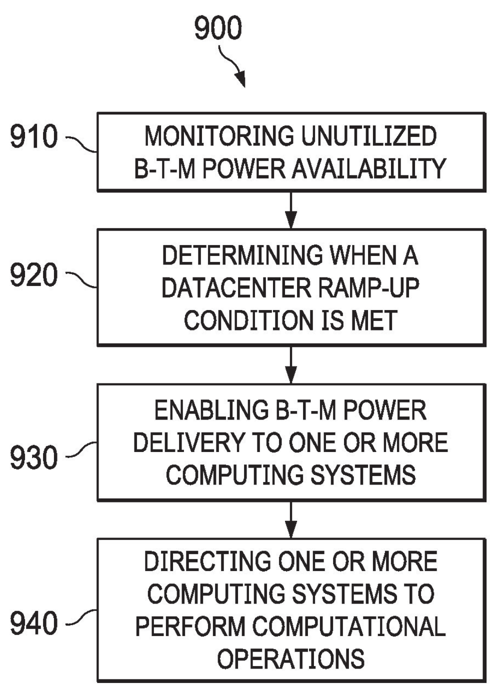
900
910
MONITORING UNUTILIZED B-T-M POWER AVAILABILITY
920
DETERMINING WHEN A DATACENTER RAMP-UP CONDITION IS MET
930
ENABLING B-T-M POWER DELIVERY TO ONE OR MORE COMPUTING SYSTEMS
940
DIRECTING ONE OR MORE COMPUTING SYSTEMS TO PERFORM COMPUTATIONAL OPERATIONS

FIG. 9

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2018/017950

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - G06F 1/26; G06F 1/20; G06F 1/30; G06F 1/32 (2018.01)
CPC - G06F 1/26; H05K 7/1497; G06F 1/20; H05K 7/1485 (2018.05)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
See Search History document

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
USPC - 713/300; 361/679.46; 361/679.02 (keyword delimited)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
See Search History document

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	US 2008/0094797 A1 (COGLITORE et al) 24 April 2008 (24.04.2008) entire document	1, 7, 15-18, 20-22 --- 2-6, 8-14, 19, 23, 24
Y	US 2010/0211810 A1 (ZACHO) 19 August 2010 (19.08.2010) entire document	2, 19
Y	US 2008/0030078 A1 (WHITTED et al) 07 February 2008 (07.02.2008) entire document	3-6, 8-14, 23, 24
Y	US 2013/0063991 A1 (XIAO et al) 14 March 2013 (14.03.2013) entire document	12
Y	US 2015/0155712 A1 (INERTECH IP LLC) 04 June 2015 (04.06.2015) entire document	24
A	US 2010/0328849 A1 (EWING et al) 30 December 2010 (30.12.2010) entire document	1-24
A	US 2013/0306276 A1 (DUCHESNEAU) 21 November 2013 (21.11.2013) entire document	1-24
A	US 2012/0300524 A1 (FORNAGE et al) 29 November 2012 (29.11.2012) entire document	1-24

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
14 May 2018	31 MAY 2018
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, VA 22313-1450 Facsimile No. 571-273-8300	Authorized officer Blaine R. Copenheaver PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/210 (second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2018/017950

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
See extra sheet(s).

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
1-24

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☐ No protest accompanied the payment of additional search fees.

Form PCT/ISA/210 (continuation of first sheet (2)) (January 2015)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2018/017950

Continued from Box No. III Observations where unity of invention is lacking

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I, claims 1-24, are drawn to a flexible datacenter comprising: a mobile container; and a behind-the-meter power input system.

Group II, claims 25-34, are drawn to a method of dynamic power delivery to a flexible datacenter using unutilized behind-the meter power comprising: monitoring unutllized behind-the-meter power availability; and determining when a datacenter ramp-up condition is met.

The inventions listed as Groups I-II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, *they lack the same or corresponding special technical features for the following* reasons: the special technical feature of the Group I invention: a flexible datacenter comprising: a mobile container; a behind-the-meter power input system; a power distribution system; a datacenter control system; and a climate control system, wherein the datacenter control system modulates power delivery to the plurality of computing systems as claimed therein is not present in the invention of Group II. The special technical feature of the Group II invention: monitoring unutllized behind-the-meter power availability; determining when a datacenter ramp-up condition is met; enabling behind-the-meter power delivery to one or more computing systems when the datacenter ramp-up condition is met; and directing the one or more computing systems to perform predetermined computational operations as claimed therein is not present in the invention of Group I.

Groups I and II lack unity of invention because even though the inventions of these groups require the technical feature of a flexible datacenter comprising one or more computing systems; and power delivery to the flexible datacenter using unutilized behind-the meter power availability, this technical feature is not a special technical feature as it does not make a contribution over the prior art.

Specifically, US 2010/0328849 to Ewing teaches a datacenter comprising one or more computing systems; and power delivery to the datacenter using power availability (if a server demands 500 watts and the PUE for the datacenter is 3.0, then the power from the utility grid needed to deliver 500 watts to the server is 1500 watts. The DCIE, in comparison, may provide a different aspect of this information, a DCIE value of 0.33 (equivalent to a PUE of 3.0) suggesting that the computing equipment consumes 33% of the power in the data center, para.0060). Further, US 2013/0306276 to Duchesneau teaches a flexible datacenter (supercomputing datacenter, Para. [0315. Maximum flexibility, para. 1500]); and using unutilized behind-the meter power availability (PERKS is hybrid energy system combining UPS with a peak-shaving system that directly captures excess or low-cost energy from a multiplicity of sources (when it is cheapest or most readily available) and stores it for later reuse, such as during peak periods, Para. [1456]. Note that excess energy is hereby "unutilized behind the meter power" as defined by applicant in Para [0041] of the specification of the present application).

Since none of the special technical features of the Group I or II inventions are found in more than one of the inventions, unity of invention is lacking.

Form PCT/ISA/210 (extra sheet) (January 2015)